

Rapid and Accurate Idea Transfer

Scientific and Technical Final Report

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<b>14. ABSTRACT</b> In business, government and military settings, slideshows (typically created and shown using Microsoft PowerPoint®) are the preferred medium for presenting complex ideas. Critics have pointed to the slavish, indeed dangerous, use of slideshows, warning of their tendency to reduce the analytic quality of presentations of evidence. The U.S. military's recognition of the pervasive use of PowerPoint presentations has led it to consider whether the conventions that such software supports may be serving as a root cause of systemic underperformance in organizations that depend heavily on the rapid and accurate communication of complex concepts. Concept Maps (Cmaps) have proven useful for capturing, organizing, and assessing knowledge. An example Cmap summarizes the report. The benefits of Cmaps for transferring knowledge have not been extensively examined, and empirical findings on the matter have mostly been limited to educational applications. This Phase I SBIR investigation presented an information set to 61 military graduate students in four formats: liner text, hypertext, a set of Concept Maps and resources, and a PowerPoint presentation.
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Preferences for the Concept Maps and PowerPoint presentation were also examined. Results showed the Concept Map group scored higher, on average, than the PowerPoint group on the key measure of knowledge transfer, and that the PowerPoint group scored better than the Concept Map group on the measure of average acquisition time. The Concept Map-based format was preferred over the PowerPoint-based format. The authors include recommendations for next generation capabilities for presenting using CmapTools.

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## CONTENTS

Preface .....	v
Summary .....	1
Introduction .....	2
Subject .....	2
Purpose .....	4
Scope .....	4
Methods, Assumptions, Procedures and Materials: Experiment .....	5
Methods .....	5
Design, Hypotheses and Variables .....	5
Participants .....	5
Assumptions .....	6
Incidental Learning Paradigm: Deception Scheme, Four Task Conditions, Recreation Task, and Short Answer Questions .....	6
Presentation Skills and/or Narration as a Confound and Barrier .....	8
Acquisition Time as a Dependent Variable .....	8
Procedure .....	8
Materials .....	9
Results and Discussion: Experiment .....	15
H1.....	15
Effort score .....	15
Recreation artifacts.....	17
Pre- and Post-test scores.....	20
H2 .....	25
Duration of the acquisition task.....	25
Materials creation time .....	25
Methods, Assumptions, Procedures and Materials: Survey .....	26
Methods .....	26
Design.....	26
Respondents.....	26
Hypotheses .....	26

Assumptions .....	26
Against Concept Maps .....	26
Respondents, snowball sampling and familiarity.....	26
Procedure.....	27
Materials.....	27
Results and Discussion: Survey .....	30
H3 .....	30
Preference .....	30
Willingness .....	30
Conclusions .....	32
H1 .....	32
H2 .....	32
H3 .....	33
Recommendations .....	34
References .....	36
Appendix A.....	38
Original Source article.....	38
Appendix B.....	50
PowerPoint slides, in thumbnail.....	50
Appendix C.....	51
Reasons for and against Cmap and PowerPoint preference .....	51
Reasons for Cmap preference.....	51
Reasons against Cmap preference .....	52
Reasons for PowerPoint preference .....	53
Reasons against PowerPoint preference .....	53

## LIST OF FIGURES

<b>Figure 1: Traditional text samples .....</b>	10
<b>Figure 2: Hypertext samples.....</b>	10
<b>Figure 3: PowerPoint presentation samples.....</b>	11
<b>Figure 4: Concept Map samples.....</b>	12
<b>Figure 5: Concept Map sample #1 at viewable scale.....</b>	12
<b>Figure 6: Concept Map sample #2 at viewable scale.....</b>	12
<b>Figure 7: Mean Effort scores and SD .....</b>	16
<b>Figure 8: Mean Wordcounts and SD .....</b>	18
<b>Figure 9: Mean Proposition counts and SD .....</b>	19
<b>Figure 10: Mean Pre-test scores and SD .....</b>	20
<b>Figure 11: Mean Post-test scores and SD .....</b>	21
<b>Figure 12: Performance on each question, by group .....</b>	22
<b>Figure 13: Difference between Pre- and Post-test scores .....</b>	23
<b>Figure 14: Mean Difference between Pre- and Post-test scores and SD, exclusive of outlier questions .....</b>	24
<b>Figure 15: Mean duration of acquisition time and SD.....</b>	25

## LIST OF TABLES

<b>Table 1: Mean Effort scores and standard deviations (SD).....</b>	16
<b>Table 2: Methods of recreation.....</b>	17
<b>Table 3: Mean Wordcounts and SD .....</b>	18
<b>Table 4: Mean Proposition counts and SD .....</b>	19
<b>Table 5: Mean Pre-test scores and SD .....</b>	20
<b>Table 6: Mean Post-test scores and SD .....</b>	21
<b>Table 7: Mean Difference between Pre- and Post-test scores and SD.....</b>	23
<b>Table 8: Mean Difference between Pre- and Post-test scores and SD, exclusive of outlier questions .....</b>	24
<b>Table 9: Mean duration of acquisition times and SD .....</b>	25
<b>Table 10: Types of ideas to present as Concept Maps .....</b>	30
<b>Table 11: Reasons for less willingness to present using Concept Maps .....</b>	31

### Preface

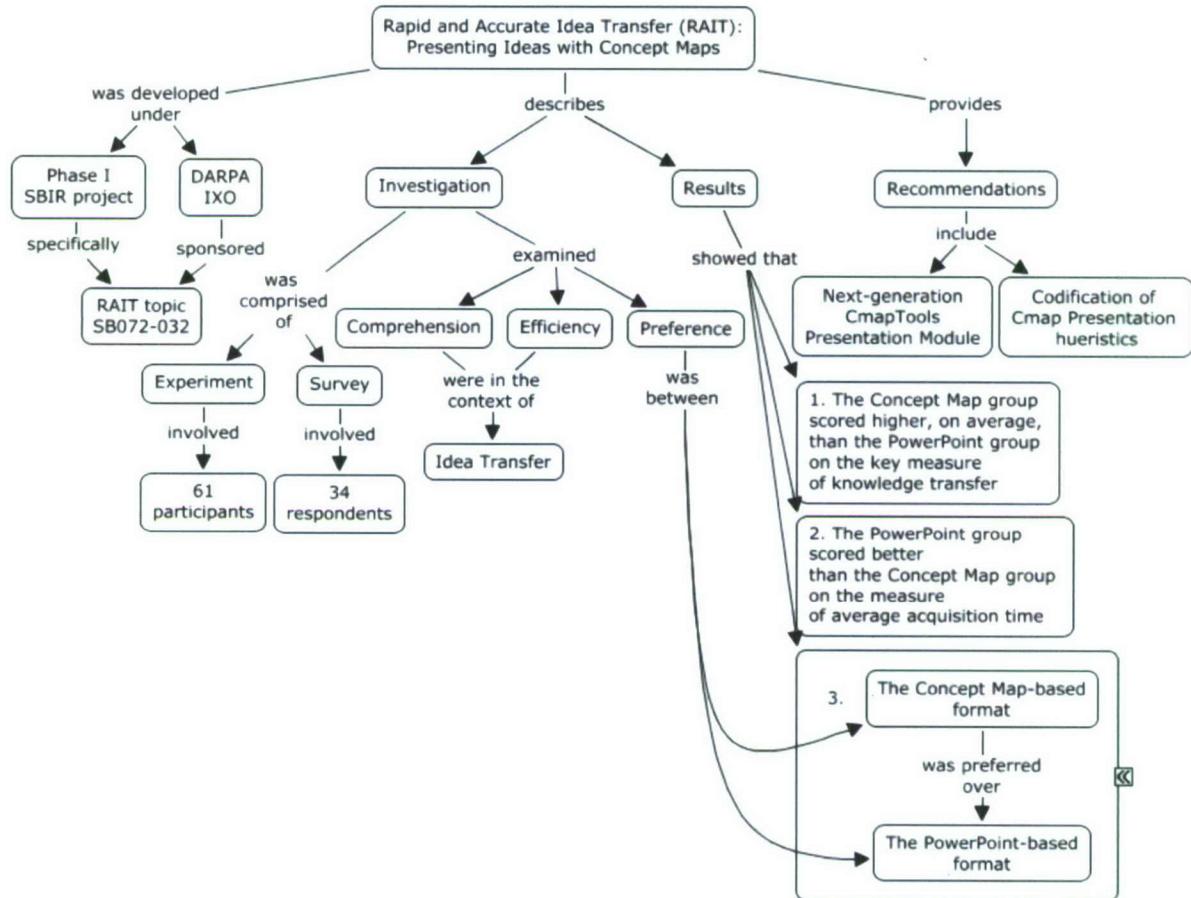
This Phase I Small Business Innovative Research (SBIR) project was sponsored by the Defense Advanced Research Projects Agency (DARPA), under the Information Exploitation Office (IXO)'s Rapid and Accurate Idea Transfer (RAIT) topic (FY2007.2 SBIR, SB072-032).

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The authors thank the 61 participants and 34 respondents who contributed to this investigation.

## Summary



## Introduction

This report reviews the authors' Phase I Small Business Innovative Research project, sponsored by DARPA IXO's Rapid and Accurate Idea Transfer (RAIT) topic. This report is intended primarily for the Sponsor, Program Manager and staff, and Technical Monitor. The material is pertinent for a wider audience interested in knowledge visualization and presentation. The authors represent the prime contractor, Perigean Technologies LLC, of Spotsylvania, VA, and its subcontractor, the Institute for Human and Machine Cognition (IHMC), of Pensacola, FL. The authors received substantial support from research partners at the Naval Postgraduate School in Monterey, California (hereafter "NPS partners").

## Subject

In business, government and military settings, slideshows (typically created and shown using Microsoft PowerPoint®) are the preferred medium for presenting complex ideas. The scholarly paper remains the preferred method in academic circles. Tufte (2006) and other critics have pointed to the slavish, indeed dangerous, use of slideshows, warning of their tendency to reduce the analytic quality of presentations of evidence. The U.S. military's recognition of the pervasive use of PowerPoint presentations has led it to consider whether the conventions that such software supports may be serving as a root cause of systemic underperformance in organizations that depend heavily on the rapid and accurate communication of complex concepts. This consideration gave rise to this Phase I SBIR project.

Concept Maps (Cmaps) are graphical tools for organizing and representing knowledge (Novak and Cañas, 2008). The Summary of this report is presented as a Concept Map. They include concepts, usually enclosed in circles or boxes of some type, and relationships between concepts indicated by a connecting line linking two concepts. Words on the line, referred to as linking words or linking phrases, specify the relationship between the two concepts. A concept is defined as a perceived regularity in events or objects, or records of events or objects, designated by a label. The label for most concepts is a word, although sometimes symbols such as + or % are used, and sometimes more than one word is used. Propositions are statements about some object or event in the universe, either naturally occurring or constructed. Propositions contain two or more concepts connected using linking words or phrases to form a meaningful statement. Sometimes these are called semantic units, or units of meaning, and a Concept Map consisting only of a set of interlinked propositions can be called "propositionally coherent." CmapTools is a software environment developed at IHMC that empowers users, individually or collaboratively, to represent their knowledge using Concept Maps, to share them with peers and colleagues, and to publish them (Cañas 2004a). CmapTools enables the creation of "knowledge models," sets of Cmaps and associated resources (e.g., pictures, statistical graphs, text) linked together through hyperlinks.

Concept Maps have proven useful for capturing, organizing, and assessing knowledge (Cañas 2004b, Cañas 2006). Benefits in terms of communication value and effectiveness have primarily been demonstrated for those who create Cmaps. The benefits of Cmaps for *transferring* knowledge have not been as extensively examined, and empirical findings on the matter have mostly been limited to educational applications (Cañas 2004a, Cañas 2006). Where Cmaps have been compared to other strategies for knowledge transfer, Cmaps have consistently shown promise. Puntambekar et. al. (2007) demonstrated the advantages (compared to hyperlinked text

pieces) of a Concept Mapped Project-based Activity Scaffolding System for increasing the understanding of the interconnected nature of the concepts and principles in middle-school science. Kinchen and Cabot (2007), in looking at dental education, showed that Cmap presentations lead to better transfer than sequential PowerPoint presentations when the aim of knowledge transfer is a deep understanding of the subject, as opposed to the memorization of facts.

Outside of the classroom, where the goals of knowledge transfer may not only be learning but also strategizing, argumentation, planning, decision making, policy making, and other practical functions, it has been claimed that Cmaps lead to improvement in the effectiveness and efficiency of knowledge transfer of complex ideas. Hoffman and Shattuck (2004), using a study design biased *against* Cmaps, found that Army officers, both junior and senior, performed as well using a Concept Map version of their traditional Operations Order (OPORD) as with the traditional paragraph format, on measures of comprehension and recall. Wagoner (2004), presenting data from the same experiment, showed a search efficiency improvement of up to 40% for expert viewer of the Cmaps. Despite such potential gains, Wagoner also found a predictable reluctance that many people feel to change from the traditional, linear, text-only format of operational order. This latter finding is of particular interest for the present SBIR project. One reason it is a problem to easily demonstrate the value of Cmaps is that Cmaps are new to most people. The notion of a meaningful diagram and the concept of “propositional coherence,” require people to learn a new method with diagrams and logic. Communicating by making or viewing a good Cmap is not the same as communicating with sentences. Any presentation about Cmaps should explain what Cmaps are all about.

Ultimately what will be required for Cmaps to truly provide value is the creation of a knowledge culture that is familiar with Cmaps. Certain trends suggest that this is happening. According to IHMC’s CmapTools Program Director Alberto Cañas, on average 600 people per day download CmapTools, and the total number of downloads since the software was first made available in December 2003 has exceeded 1,000,000 (personal communication, July 10, 2008). CmapTools are being used extensively throughout the world, including use as a fundamental part of the educational infrastructures in entire nations. Cmap workshops and seminars are springing up at a number of universities and in a number of countries. Cmapping is coming to be used extensively in capturing and preserving expert knowledge as a part of knowledge management efforts in the private sector (Ziebel, 2008). Within the US government, CmapTools are used in training applications by the Naval Education and Training command, and being used to scaffold brainstorming in a number of NASA projects.

These trends are extending to knowledge transfer. In a study by Hoffman et al. (2000, 2001, 2006) a Cmap-based model of the knowledge and reasoning of expert forecasters was prepared for a Naval Air Station meteorological facility. That “knowledge model” included all of the information contained in the traditional “Local Forecasting Handbook,” along with additional information and resources (e.g., charts of local climatological trends, hyperlinks to radar and satellite imagery, etc.), all linked together using Cmaps made by the expert forecasters. As new apprentice aerographers would rotate into the Naval Air Station, they studied in order to prepare for their exam to qualify as regional forecasters by using the Cmap knowledge model. Interestingly, the older forecasters, those who had qualified at more locations, preferred their familiar Handbook text and its standard Navy format. Younger aerographers preferred the Cmap

version, saying that it was like an intellectual game to pursue the links and relations across the Cmaps (e.g., thunderstorm dynamics, thunderstorms as affected by the Gulf of Mexico, and so forth). When taking their qualifying exams they distinctly remembered relying on information they read or viewed in the Cmap environment. CmapTools are also growing significantly in use in the intelligence analysis community, and not only as an aid in analytical work. The creation of a good Cmap to express an analysis and integrate data resources not only serves the analytical purpose but the Cmap itself can be the analytical report, thus saving analysts considerable time. All of these applications and trends suggest that a culture that understands the benefits of creating and sharing Cmaps is emerging.

And yet, there remains a general reluctance to stray from traditional, or rather ubiquitous, use of some forms of information presentation.

### **Purpose**

The purpose of this Phase I project was to investigate the effectiveness (i.e., accuracy), efficiency (i.e., rapidity) and preference of Cmaps compared to other formats – primarily PowerPoint slides – in the context of idea transfer. Specifically, Cmaps produced using IHMC's CmapTools were investigated.

### **Scope**

The formal investigation was conducted from April 2008 through May 2008. It consisted of: (1) an experiment conducted with 61 participants at the Naval Postgraduate School in Monterey, California, and (2) a preference survey conducted online with 34 respondents. A pilot exercise, based on an early design of the experiment, was conducted by NPS partners in March 2008 to test experimental methodology.

The investigation was limited by providing – i.e., not presenting – the formats to participants and respondents. Participants and respondents independently reviewed the materials in different formats, without the presence of a presenter, rather than in an imitation of an audience-and-presenter venue.

The report provides a review of the methods and results obtained. It details the methods, assumptions and procedures used to conduct the experiment and the survey. It provides access to the materials used in both investigations. Next, it presents the results obtained in both portions. It then presents the authors' interpretations of the results, and concludes with recommendations for further research and development.

## **Methods, Assumptions, Procedures and Materials: Experiment**

This section details the methods, assumptions and procedures involved in the experiment portion of the investigation.

### **Methods**

#### Design, Hypotheses and Variables

The experiment involved a Between Subjects, Pre- and Post-Test design. Participants were presented with a Pre-test questionnaire (which simultaneously served as a content familiarity test), followed by an acquisition task, and finally a Post-test recreation task and questionnaire.

The hypotheses were:

**Hypothesis #1 (H1):** The presentation of information in Concept Map-based format will result in better comprehension of information, as compared to presentations of information in traditional, or *linear*, text- (i.e., journal article), hypertext- (i.e., hyperlinked text pieces of the journal article), and PowerPoint-based formats (i.e., slideshows).

**Hypothesis #2 (H2):** The presentation of information in Concept Map-based format will result in greater efficiency of information transfer, as compared to presentations of information in traditional, or linear, text-, hypertext- and PowerPoint-formats.

The only Manipulated Variable was the Formats. The Dependent Variables were:

**H1: Incidental Recall** (evaluated via Pre-test questionnaire, Recreation task and Post-test questionnaire)

**H2: Duration of Acquisition** (measured via Time in minutes).

Because the focus of the RAIT program is, ultimately, efficiency of idea transfer for impact on operational performance, creation time for the experiment materials (i.e., the Concept Maps and the PowerPoint presentation) was also recorded, and considered relevant to **H2**.

#### Participants

The participants were 61 graduate students at Naval Postgraduate School, Monterey, California. The students were officers of various ranks in the United States Military. Participants were recruited and selected for the study with no regard for age or gender, and they were not compensated or awarded for their participation.

Participants were randomly assigned to one of four groups each with N=15 (the hypertext group was assigned an additional participant after one participant was determined to be quite disengaged in the procedure, for a total N=61).

### Assumptions

The experiment design and associated materials were based on a number of assumptions that emerged both out of the authors' perspective on experimental design principles and contingencies discovered during the pilot exercise.

#### Incidental Learning Paradigm: Deception Scheme, Four Task Conditions, Recreation Task, and Short Answer Questions

The RAIT program is ultimately about the transfer of ideas, in terms of speed and accuracy. The primary focus of the investigation was on accuracy. The authors submit, though, that the intended goal of RAIT is not simply to improve the ability to recognize facts. Rather, RAIT aims to improve the *recall of complex and inter-related concepts* – that is, improving the ability of the recipients to recall complex information and conceptual relationships by creating memory structures that “stick.” With this envisioned goal in mind, the authors developed a variation on the incidental learning paradigm. The authors adopted the incidental learning paradigm, since incidental recall can be a strong test of memory, and hence comprehension. The incidental learning paradigm is widely used to investigate learning without intent. “At the beginning of the experiment, participants think that their only task is to rate the acquisition stimuli...they do not know that they will later be asked to recall the acquisition [matter]. The purpose of this incidental procedure is not to trick the [participants], but to investigate how particular types of acquisition activities affect learning and subsequent recall” (Bransford, 1979). The incidental learning paradigm presumes that information processed at deeper (i.e., more conceptually connected) levels will result in superior recall of information. Thus, incidental recall is taken as a better test of memory strength than either cued recall task or recognition tasks. This consideration dovetails with Kinchen and Cabot's (2007) results showing that Concept Maps enable deeper levels of information processing over PowerPoint, since participants showed better recall of concepts, versus recall of isolated facts.

In order to put the incidental learning paradigm in play with the study participants, the authors required a reason for the participants to execute the acquisition task that did not foreshadow a recall test. Given that the participants were pursuing advanced degrees in military sciences, the authors decided that a natural goal that cut across their respective courses of study would be one that involved collaborative exploration of a military challenge. In order to ground the participants in this shared goal, a scheme was developed that resulted in the following instructions to participants:

*We invite you to participate in a study in which we will present you with a current challenge for the US military: How can the US military be fully trained and prepared to engage in warfare while at the same time successfully accomplish novel missions including humanitarian missions and the rebuilding of a nation's infrastructure?*

*To begin the session, we will set the stage by having you read a briefing that presents an example scenario. We will use this scenario later to identify the current challenge the US military faces.*

*This scenario briefing comes to us from material generated by NATO, and discusses the humanitarian problems and issues involving Pakistani refugees living in Bangladesh.*

*We will ask you to read and understand the briefing material in detail. This will be a timed reading. Do not be concerned about time - it is most important that you thoroughly understand the material.*

*If you have any questions, please feel free to ask them at any time.*

The authors followed all applicable Human Subjects guidelines in the development of the scheme. Participants were debriefed at the end of the experiment using the following language:

*In this study we had you review some briefing material in one of four forms, either as a text document, as a hyperlinked outline, as a Powerpoint slide set, or as a Concept Map. We then presented you with a memory test.*

*Our purpose in this study is straight-forward. We seek to compare the communication effectiveness of these various forms of presentation format.*

*Our intended goal is to develop newer and better ways of conveying information in the briefing context.*

*The memory test was unexpected because such "incidental memory" tests are highly sensitive to comprehension and memory strength.*

*Because at the start of the study we withheld from you the fact that your memory would be tested, we now offer you the option to have your data discarded, without you incurring any penalty whatsoever. We hope you will understand our reasons, and the potential value of your data should you permit us to use them.*

*As we informed you in the Consent Form, the data will be kept strictly anonymous in that your name will not be included in any discussion or write-up of the results.*

*If you have any questions, please feel free to ask them.*

*If you wish, you can be given a copy of this Debriefing Form to keep.*

*We ask that you not discuss this experiment, or any aspects of this experiment, with other people until the study is over, this July.*

**H1** was based on the presumption that Concept Maps would enhance idea transfer because Concept Maps provide graphically and semantically organized representations of knowledge, connecting concepts by means of semi-hierarchical morphology, semantic links among concepts, and hyperlinks among Concept Maps (Novak and Cañas, 2008). Thus, the authors hypothesized that Concept Maps will enhance rapid and accurate idea transfer *because they are Concept Maps*, not simply because they are diagrams or hyperlinked information sets. In order to robustly test this hypothesis, the experiment used four task conditions – i.e., four format types – which are described below under “Materials.”

Finally, under the incidental learning paradigm, unexpected memory tasks are required to be presented following the acquisition task. The authors decided to use two recall tasks in order to test differences among the four task conditions. The authors presumed that task conditions that involve free navigation through hyperlinking would result in differences in the participants’ representation from task conditions that do not involve hyperlinking. In the first recall task, participants were required to *recreate* the information reviewed during the acquisition task. Specifically, they were asked to:

*Please use the remainder of [a blank] sheet (front side only) to create a representation of the article you just read. Include as much detail as possible, in a format of your choice. When complete, please return it to the researcher.*

In the second recall task, participants were required to answer a set of 20 open-ended questions. The authors selected fill-in-the-blank question format for its validity in testing for *recall*, versus multiple-choice items, which are a test of recognition and a less powerful test of memory strength. The questionnaire is described below under “Materials.”

#### Presentation Skills and/or Narration as a Confound and Barrier

Primarily due to the potential introduction of confounds into the experiment, information sets were presented to each participant, versus the simultaneous presentation to each entire test group. If a presenter were to present the information sets, there would be a risk of introducing confounds related to presentation abilities and style. This would be the case also were a presenter to present the information sets to individual participants. One-on-one presentation would have been time-restrictive for the authors and the NPS partners, and would have introduced a level of awkwardness that might also have served as a confound. Finally, use of presenters opened up pragmatic risks to the experiment due to the experiment location and facilities.

Narration and video recorded presentations were considered as a proxy for the use of a presenter. While narration was considered more appealing than the use of a presenter, narration would have introduced a bias against two of the task conditions, namely the two of the formats that involved hyperlinking – hypertext and Cmaps. Narration would have disabled the ability to freely explore the hyperlinks.

#### Acquisition Time as a Dependent Variable

The pilot exercise revealed important considerations with respect to acquisition time. First, participants were taking over 20 minutes to complete the acquisition task, and some participants took in excess of 60 minutes to complete the entire experiment. A main reason was that the materials had been inclusive of all of the material from the original article. Post-pilot exercise interviews also revealed that some participants rushed the Post-test tasks due to self- and environmentally-imposed (e.g., seeing other participants' progress) concerns about time.

Given the focus of the investigation on rapidity of idea transfer and its potential trade-off with accuracy (i.e., in recall), the authors decided to not strictly bound the time constraints on participants. General time constraints were suggested in the instructions (see above). In addition, the authors shortened the original version of the information set.

### **Procedure**

Step 1: Participants were randomly assigned to one of four test groups. Due to facilities constraints, participants were run, up to two per run, in separate and secluded locations.

Step 2: Participants were asked to sign a Consent Form.

Step 3: Participants were asked to complete the Pre-test questionnaire.

Step 4: Participants were provided the instructions.

Step 5: Participants were provided the acquisition materials. Participants were

provided the information set in one of four formats: linear text, hypertext, a PowerPoint presentation, and a set of Cmaps with hyperlinked resources. Each participant was timed in minutes on the duration of the acquisition task.

- Step 6: Participants were asked to complete a Recreation task – i.e., to recreate the information reviewed during the acquisition task.
- Step 7: Participants were asked to complete the Post-test questionnaire.
- Step 8: Participants received a Debrief.

## Materials

The learning materials and the test questions were developed independently so that those who worked through the source document to prepare the test questions would not be biased by having played a hand in preparing the learning materials (i.e., any inclination to have information that is salient in one or another of the formats be more likely to be queried in the recall test questions). Some members of our team developed the questionnaires, based on the original source journal article. Another member developed the Cmaps without having seen the questionnaire. The PowerPoint version was prepared by a third-party (i.e., not the authors nor the NPS partners) graphics design company with no knowledge of the nature and purposes of the study. The company was chosen for its experience in creating professional PowerPoint presentations, and was compensated via a flat-fee arrangement.

The information sets, in each of their formats, are illustrated by examples in Figures 1-4. These were derived from the source article we used (Farzana, 2008), which described a complex set of historical economic, and political circumstances of the Bihari refugee community of Bangladesh. The full original article is provided in Appendix A.

The traditional, or *linear*, text version was an abridged version of the journal article as it originally appeared, and was provided to participants as a 17-page Microsoft Word document, with a word-count of 4,523. The hypertext version was created by the NPS partners. It used the same text as the linear text version, carved into short text pieces that were hyperlinked together at appropriate relevant places within the document. This was provided to participants as 25 hyperlinked PowerPoint slides, which followed the structure of the traditional text.

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Volume 10 Number 1  
The Displaced: Bihari Community in Bangladesh: Victims of Pollution and Diplomatic Outsmarting  
Kavee Ishwaria Farook, PhD candidate, National University of Singapore, [kaveshfarook.com](http://kaveshfarook.com)

**Introduction**  
Bangladesh achieved independence from Pakistan in 1971. After independence, a considerable number of non-Bengali citizens in Bangladesh, known as the Biharis who opposed the independence of Bangladesh, wanted to go to Pakistan but could not do so due to the lack of political will by the government. They were known as "Stranded Pakistani" or the "Bihari Community". According to one report, the community is estimated to be around 1.5 million people. The Biharis are mostly Hindus. Most of them have been living in 66 squall camps with poor facilities scattered in several areas of Bangladesh for more than three decades.<sup>1</sup> Although they are residing in "refugee camp" or the "Bihari camp", they are not refugees. They have been staying in the same place for many years. Therefore, they are deprived of the benefits and opportunities as extended to the regular citizens of Bangladesh.<sup>2</sup> As a consequence, the stranded Biharis in Bangladesh face multiple problems.

The objective of this paper is to examine the status of the Bihari people in Bangladesh, highlight the sociopolitical impacts of their strandedness, and study as the displaced population. The paper is divided into four sections. The first section discusses the fact that the Bihari community in Bangladesh is an "artificial minority" because they are unwanted citizens of Bangladesh. The second section discusses the Biharis who are living there as unwanted refugees. The severely odious status of the Biharis is a result of deliberate manipulation and political induction on the part of both Bangladeshi and Pakistani. The analysis of the third section is the Biharis' socio-political status in Bangladesh. This section discusses the background to the Biharis' problems and their political status in Bangladesh. The fourth section discusses the Biharis' problems in Bangladesh. Finally, the fifth section discusses the diplomatic snuff-out over the repatriation of the stranded Biharis.

**Background to the Problem**  
Displaced Biharis from India in 1947, around one million Urdu-speaking Muslims from the present day Indian provinces of Bihar, Uttar Pradesh, Madhya Pradesh and Karnataka had to leave their homes due to the partition of India. The partition of East Pakistan was due to a desire to escape from continual bloodshed and "to preserve our language and culture".<sup>3</sup>

The Bihari community is also referred to as Muslim (classified by the Census of Pakistan, 1951) "as per an agreement between the two countries, the Biharis would be identified as Bengalis",<sup>4</sup> and the Biharis in Bangladesh are Bengali. However, the Biharis are a distinct people. The Biharis in Bangladesh are descendants of those who came to Bangladesh or erstwhile Pakistan.<sup>5</sup> See, Choudhury (1992:204).

<sup>1</sup> See, Choudhury (1992:204).  
<sup>2</sup> See, Choudhury (1992:204).  
<sup>3</sup> See, Choudhury (1992:204).  
<sup>4</sup> See, Choudhury (1992:204).  
<sup>5</sup> See, Choudhury (1992:204).  
<sup>6</sup> Based on the interview with the headmaster in the month of October 26, 2002.  
<sup>7</sup> April 2003, exchange rate, US \$ = 60 taka.

The schooling facility inside the camp is extremely inadequate. There are a total of 55 thousand students in the schools inside the camp. This means that average number of students in a family is five. The current number of students in schools across the country is 750. It is reported that only one percent of the Bihari children receive education. The Biharis are denied basic education as they are not getting any kind of assist from the government for their children to get educated. It is reported that the Biharis are not able to afford the fees. Due to their poor terms of economic condition, they are not able to afford it.<sup>6</sup>

In the Mohorjuriya Camp, there is only one school named Non Local Junior High School, established in 1974. The school is from kindergarten to Level eight. The school has 1500 students. The students are mostly Biharis. The headmaster of the school is Mr. Ali, admitted that in 1993-94 there were around 450 students in the school but the number decreased to only about 150 in 2003. The headmaster complained that there is a lack of teachers and the school does not have enough classrooms. Classes are held irregularly. Tuition fees for different classes are 40 to 80 taka (Bangl. taka) per month per student. The students are not provided with books. The students have to buy their books from the government. Recently, some NGOs such as Social and Economic Development Program (SEDP) have provided free education for some students up to class six in primary school. The rest of the school age children do not get this opportunity.

**Life in Camps**



**Living Areas**



The schooling facility inside the camp is extremely inadequate. There are a total of 55 thousand students in the schools inside the camp. This means that average number of students in a family is five. The current number of students in schools across the country is 750. It is reported that only one percent of the Bihari children receive education. The Biharis are denied basic education as they are not getting any kind of assist from the government for their children to get educated. It is reported that the Biharis are not able to afford the fees. Due to their poor terms of economic condition, they are not able to afford it.<sup>6</sup>

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**United States and Other Global Countries.**

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**Figure 1: Traditional text samples**

**Figure 2: Hypertext samples**

The PowerPoint designer was provided with the traditional text version and was instructed to prepare a professional-looking presentation using his own design intuitions and discretion. Certain additional constraints were provided and were based explicitly on Tufte's (2006) critique of PowerPoint, which was a driving factor in our sponsor's interest in studying alternative methodologies for briefing. The constraints were:

- Assume a presentation of approximately 20 minutes in duration, with the codicil of allowing the length of the presentation to principally be dictated by the content (not the time),
  - Represent all of the source document material (some of the material became the “Notes” that appeared under some of the slides),
  - Have no more than 40 words per slide, and
  - Use multiple features of PowerPoint (which Tufte criticizes), as deemed appropriate, including bullet lists, templates, background graphics, photos, animations, sounds, summaries of statistical data, and AutoContent Wizard.

The PowerPoint version was provided to Participants as a 56-slide presentation, with an

approximate word-count of 1420, not including the text included in the Notes. Participants viewed the presentation in slideshow mode, but were not constrained to remain in that mode. Participants had access to the Notes in hardcopy. The complete set of PowerPoint slides, in thumbnails, is provided in Appendix B.

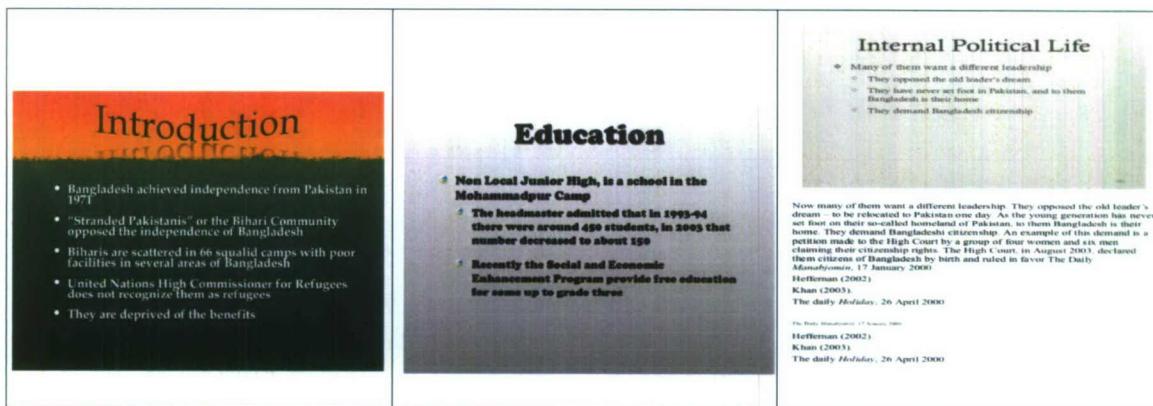


Figure 3: PowerPoint presentation samples

The Concept Map version was prepared by the authors using CmapTools. Creation of the Cmaps was undertaken primarily by one authors who kept purposefully unaware of the content of the questionnaires. The traditional text version was transformed into 16 “propositionally coherent” and hyperlinked Cmaps. Hoffman (Crandal, Klein, Hoffman 2006) explains: “Using the link labels to express relations between two concepts, the node-link-node triples in Concept Maps form propositions, that is, they can be read as ‘stand alone’ simple and meaningful expressions” (p. 51). When all of the triples in a Concept Map are well-formed propositions, the Concept Map is said to be ‘propositionally coherent.’ In total, the Cmaps included 301 separate concepts, 344 propositions, and 3,345 words (not including the brief text pieces attached as resources). As each Cmap was made, propositions in the original text were marked off (understanding that a single sentence typically contains more than one proposition). An independent check confirmed that the Cmaps (with the text pieces included in the Notes) included all of the material in the original document. Hyperlinked to the Concepts were 22 Resources (e.g., text documents, photos) taken from the source article. In general, the material selected for inclusion in brief text pieces was material that conveyed a detailed example, e.g., health care in the refugee camps was illustrated by a description of the health care facility at on particular refugee camp. Where Resources were added, the color of the concept nodes was changed to yellow in order to show that the node had a link, and to encourage participants (who would be unfamiliar with Cmaps) to follow the hyperlinks (shown in bold in Figures 5 and 6). The Cmaps and resources were presented in an .html browser to enable all Cmaps and resources to be presented in the same application. Thus, Cmaps were presented in whole, not piecemeal or stepwise, as each Cmap was selected. The icon and hyperlink for CmapTools that is standard for .html exported Cmaps was removed.

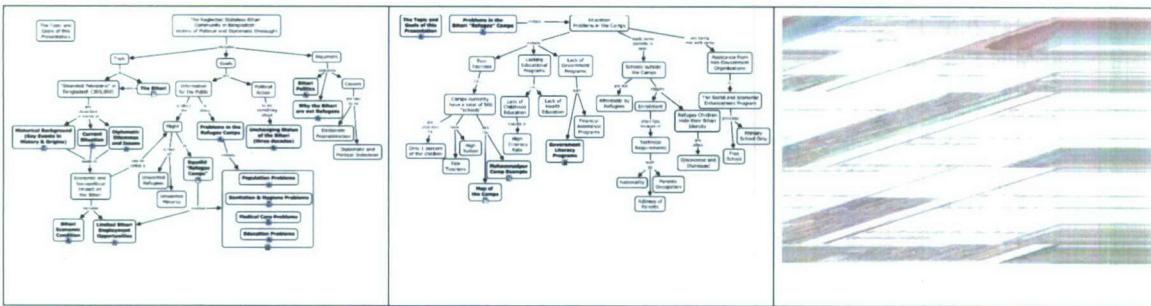


Figure 4: Concept Map samples

Figures 5 and 6 present the Cmaps at viewable scale.

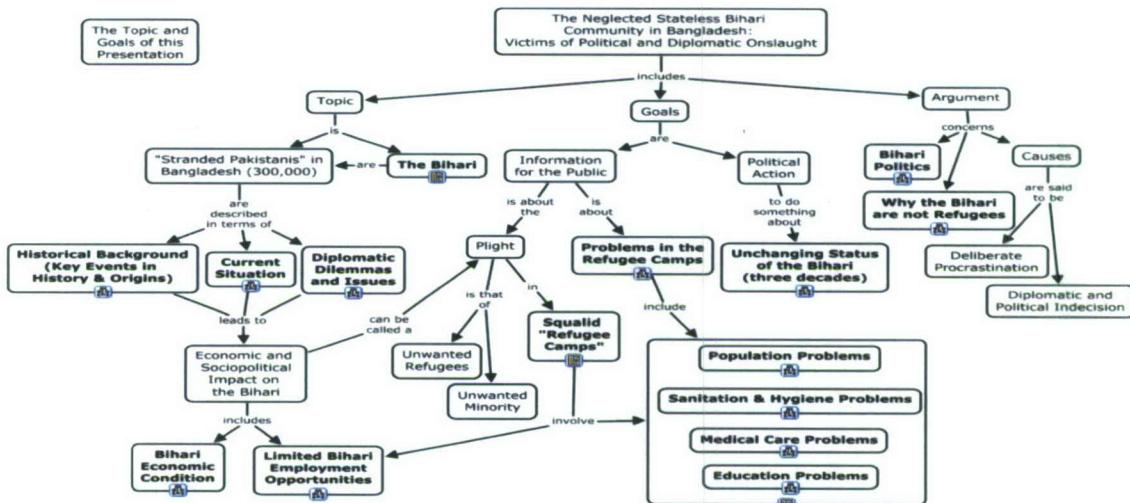


Figure 5: Concept Map sample #1 at viewable scale

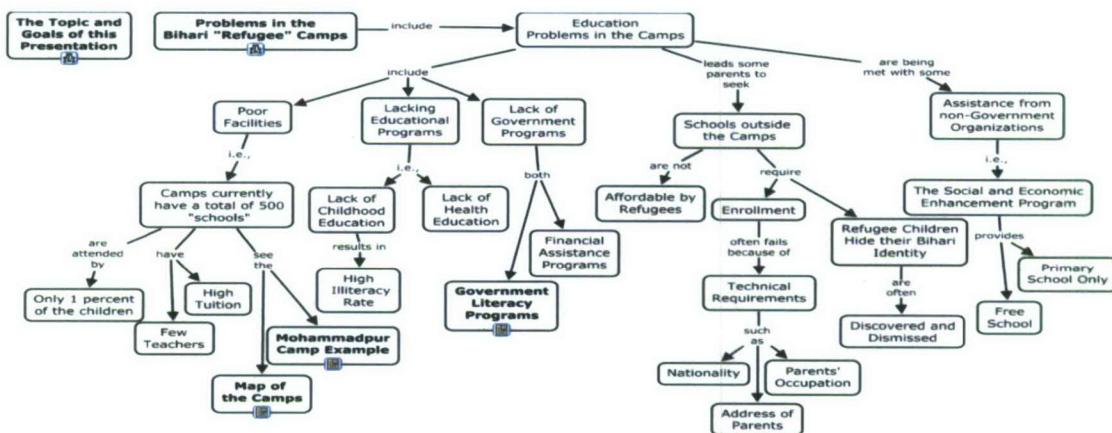


Figure 6: Concept Map sample #2 at viewable scale

The entire set of test Cmaps is viewable beginning at:

<http://perigeantechnologies.com/raitcmaps/start here.html>

USER: raitcmaps

PASSWORD: Per1gean

The questionnaires were developed primarily by our NPS partners, with oversight by the author who was not the author who created the Cmaps. The Pre-test questionnaire consisted of 10 fill-in-the-blank questions, drawn from sections throughout the article:

1. The Bihari are native to the country of \_\_\_\_.
2. Bangladesh achieved independence from Pakistan in \_\_\_\_.
3. Bangladesh is bordered by \_\_\_\_ on three sides.
4. \_\_\_\_ is one of the languages spoken in the Bihari camps.
5. The Bihari are deprived of UN benefits because they are not considered \_\_\_\_.
6. The older generations of Biharis want to return to \_\_\_\_, instead of staying part of Bangladesh.
7. The Bihari \_\_\_\_ the Bengali struggle for independence.
8. The population of Bihari living in refugee camps has \_\_\_\_ over time.
9. \_\_\_\_ and \_\_\_\_ are factors that determine minority status in Bangladesh.
10. One survey of the camps show that \_\_\_\_% of infants die before reaching childhood.

The Post-test questionnaire consisted of 20 fill-in-the-blank questions. The questions were also drawn from sections throughout the article. Specifically, they were distributed across the article, with one to three questions per section included in the list of 20. The questions were also scored by three NPS partners on difficulty, resulting in five questions scored as easy, 10 scored as mid-level, and five scored as difficult. Five questions required numeric answers, eight required identification of something, and seven required description of something. Three questions from the Pre-test were included in the Post-test.

1. At the end of the day, people in the camps take home about \_\_\_\_ taka to feed their families.
2. \_\_\_\_ is the method of choice for crimes against the camps.
3. “Reaching Out of School” has taken the initiative to improve the rate of child literacy over the 6 [sic] six years. The project plans to educate \_\_\_\_ hundred thousand children.
4. \_\_\_\_ and \_\_\_\_ are factors that determine minority status in Bangladesh.
5. One survey of the camps show that \_\_\_\_% of infants die before reaching childhood.
6. List 4 common diseases in the refugee camps. \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_.
7. \_\_\_\_ An estimated 20,000 unmarried girls are now vulnerable to \_\_\_\_ for a

- living due to scarcity of jobs.
8. \_\_\_\_\_ is an organization that provides food to the camps.
  9. The current number of schools in camps across the country is \_\_\_\_\_.
  10. The older generations of Biharis want to return to \_\_\_\_\_, instead of staying part of Bangladesh.
  11. A \_\_\_\_\_ well is the main source of water in the camps.
  12. The official language of Pakistan is \_\_\_\_\_.
  13. The central thesis of this briefing is that the Bihari community in Bangladesh is an \_\_\_\_\_ \_\_\_\_\_.
  14. What body of water is located to the south of Bangladesh? \_\_\_\_\_
  15. The Bihari Muslims voluntary [sic] migrated to East Pakistan in 1947 from \_\_\_\_\_.
  16. Bangali's [sic] form the major ethnic group in Bangladesh with \_\_\_\_\_ % of the total population.
  17. Bihari school(s) have trouble retaining teachers because they are not \_\_\_\_\_.
  18. Mr. Alhaj M. Nasim Khan is the chief of what organization? \_\_\_\_\_
  19. \_\_\_\_\_ camp had the largest number of families and persons living there in 1992.
  20. The ethnic identity Bihari has a \_\_\_\_\_ meaning in Bangladesh.

## **Results and Discussion: Experiment**

This section presents and discusses the results for the experiment, by hypothesis.

### **H1**

To test H1, the authors conducted an analysis of the recreation artifact created and the Pre- and Post-test questionnaires completed by each participant during the incidental recall phase of the experiment.

At the outset of the data analyses, it became apparent that a few extreme performance outliers existed. To explore this, an overall Effort score was calculated. As a result of the Effort scores, three participants were discounted from the remainder of the analysis.

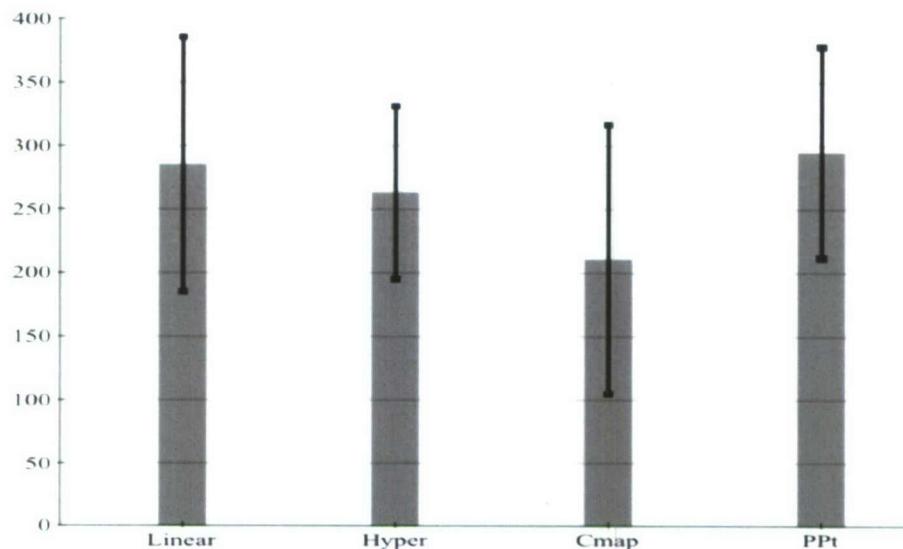
#### Effort score

As a measure of each individual's overall effort, the authors summed for each participant the duration of acquisition, Post-test scores, and word and proposition counts for the recreation artifacts. Inclusion of the Post-test scores in the effort score was considered necessary because it offset a potential bias against short durations of acquisition by particularly fast readers.

The mean effort score across all participants was 263.78, with a standard deviation (SD) of 113.53.

**Table 1: Mean Effort scores and standard deviations (SD)**

	Linear	Hypertext	Cmap	Ppt
Mean	285.38	263.25	210.82	294.92
SD	100.09	68.24	105.72	83.28



**Figure 7: Mean Effort scores and SD**

The lowest four effort scores were 93.5, 63, 46.25, and 38. The fourth lowest score (93.5) was that of a participant who was observed by an NPS partner to have not reviewed an entire portion of the acquisition information. Following this observation, the NPS partners recruited an additional participant. *For the analysis, the three effort scores lower than 93.5 were discounted from all calculations.* Two scores (63 and 38) were from the Cmap group, and one (46.25) was from the PowerPoint group.

Recreation artifacts

The format of the recreation artifact (i.e., whether a participant recreated the information set in text, bulleted-list, or some form of net-like-format) was scored. (Scores in parentheses indicate totals had the excluded participants been counted.)

**Table 2: Methods of recreation**

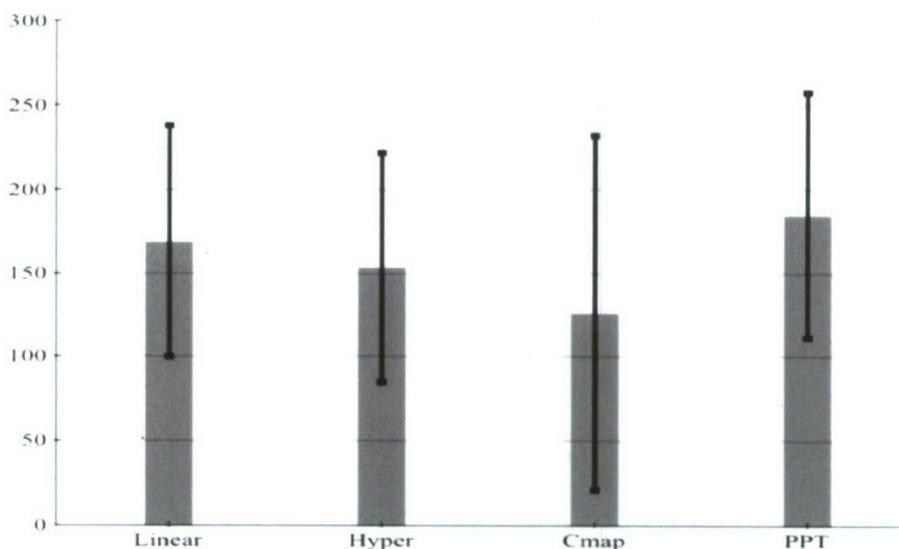
	Linear	Hyper	Cmap	PPT
Text	10	7	3	6 (7)
Bulleted-list	6	8	7	8
Net-like		1	3 (5)	

The recreation artifact was also scored by wordcount and proposition counts. The wordcounts were measured with the wordcount feature in Microsoft Word. The proposition lists were created by one of the authors, and by Professor John Coffey of the University of West Florida, an expert in Concept Mapping. Professor Coffey was not made aware of the purpose of the proposition lists until after he had created them. The lists were deemed accurate representations of the recreation artifacts via two waves of inter-scorer reliability checks.

A one-way ANOVA was conducted to analyze the groups and the wordcounts. Statistical significance was not achieved:  $F(3, 58) = 1.33$ ,  $MS_e = 6284.18$ ,  $p = .28$ . The mean wordcount and standard deviations respectively across all participants was 158.14, 80.47.

**Table 3: Mean Wordcounts and SD**

	Linear	Hypertext	Cmap	PPt
Mean	168.67	153.38	126.46	184.57
SD	69.0	68.24	105.48	73.02

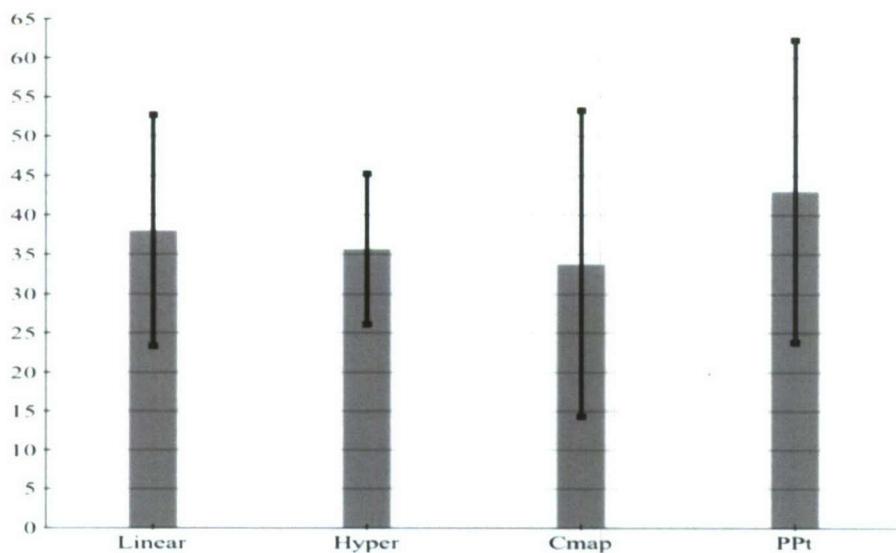


**Figure 8: Mean Wordcounts and SD**

A one-way ANOVA was run to analyze the groups and the proposition counts. Statistical significance was not achieved:  $F(3, 58) = .87$ ,  $MS_e = 219.97$ ,  $p = .47$ . The mean proposition counts and standard deviations respectively across all participants was 37.53, 16.01.

**Table 4: Mean Proposition counts and SD**

	Linear	Hypertext	Cmap	PPt
Mean	38	35.69	33.77	43
SD	14.66	9.55	19.46	19.21



**Figure 9: Mean Proposition counts and SD**

### Pre- and Post-test scores

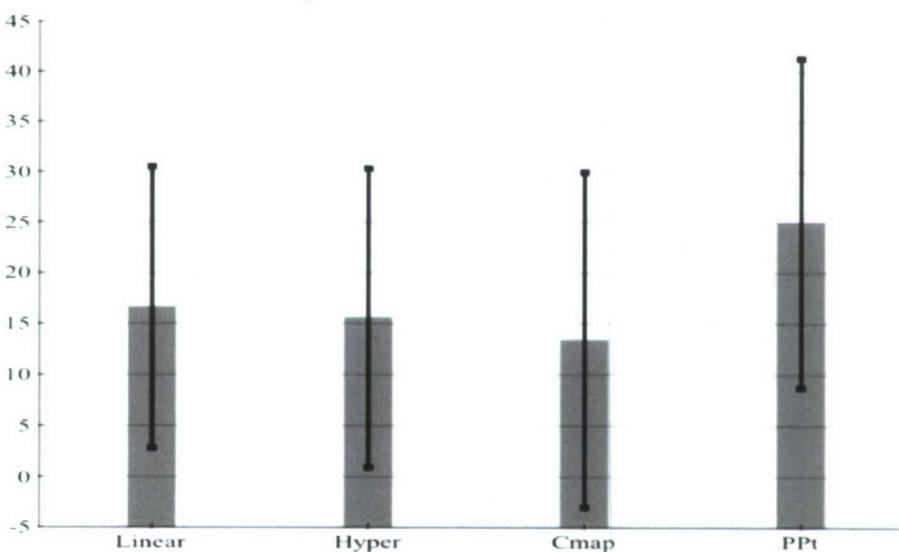
Each Pre- and Post-test questionnaire was scored independently by two members of the NPS partners using a scoring key. One of the authors then scored all of questionnaires to check for accuracy. Given the complexity of the information set, questions requiring descriptive answers or names of entities were marked conservatively, with allowances for spelling and semantic similarity. For example, a question requiring “Bay of Bengal” was credited for answers such as “Sea of Bengal” and “Bengali Sea.” Numeric answers were strictly marked.

The Pre-test questionnaire was used both as a baseline to measure knowledge transfer and to determine if any participants had extensive prior knowledge on the article subject before beginning the study. Somewhat unexpectedly, one participant had considerable prior knowledge of the Bihari, scoring above 80% on the Pre-test. This participant did not continue with the experiment after the Pre-test.

Scores are reported as ##.##% correct. A one-way ANOVA was conducted to analyze the groups and the Pre-test scores. Statistical significance was not achieved:  $F(3, 58) = 1.51$ ,  $MS_e = 354.82$ ,  $p = .22$ . The mean Pre-test score and standard deviations respectively across all participants was 17.70%, 15.23.

**Table 5: Mean Pre-test scores and SD**

	Linear	Hypertext	Cmap	PPt
Mean	16.67	15.63	13.46	25
SD	13.84	14.71	16.51	16.29

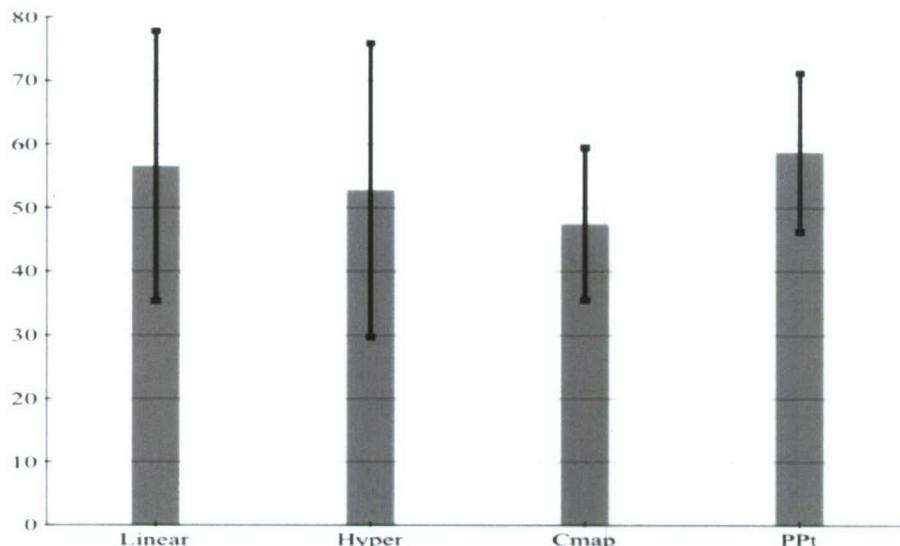


**Figure 10: Mean Pre-test scores and SD**

A one-way ANOVA was conducted to analyze the groups and the Post-test scores. Statistical significance was not achieved:  $F(3, 58) = .99$ ,  $MS_e = 329.86$ ,  $p = .41$ . The mean Post-test score and standard deviations respectively across all participants was 52.46%, 19.16.

**Table 6: Mean Post-test scores and SD**

	Linear	Hypertext	Cmap	PPt
Mean	56.58	52.81	47.49 <sup>1</sup>	58.75
SD	21.22	23.07	11.94	12.44

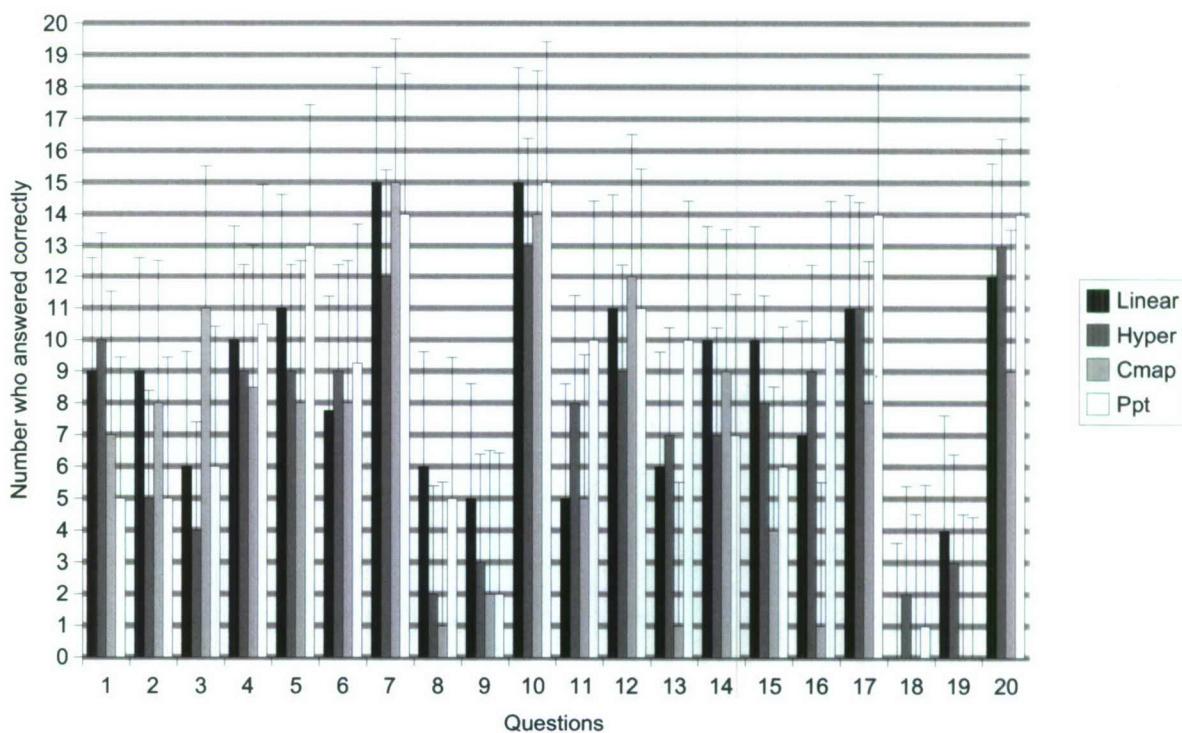


**Figure 11: Mean Post-test scores and SD**

The authors examined the results question by question to see if any questions dramatically distinguished among the groups. Figure 12 presents performance on each question, by group, and standard deviations for each, and shows that three questions can be considered outliers. For Question 3, the Cmap group scored significantly better than the other groups. The answer to Question 3 was directly stated in a text resource attached to a Concept Map. That is, for this

<sup>1</sup> The Post-test score for one of the Cmap group participants was adjusted by a method of proportions to account for accidental noncompletion of the final six questions on page two of the Post-test questionnaire. The mean score for all other participants on the final six questions (44.72%) was averaged with the participant's score (75%) for the first 14 questions (on page one of the questionnaire), for a conservatively adjusted score of 59.86%.

Question, there was effectively no difference between the format representation and that of the Linear and Hypertext groups. Thus, a rationale for the superior performance of the Cmap group was not suggested. (The performance did, however, offer compelling anecdotal evidence that the Cmap group participants followed all of the hyperlinks.) For Question 13, the Cmap group scored significantly worse than the other groups. While the answer was directly stated in the other groups, it was not as directly stated in the Concept Maps. That is, the question asked what the central thesis of the brief was, and the answer was "artificial minority." PowerPoint slide #5, titled "Thesis," had "artificial minority" as the first bullet, whereas "artificial minority" was found under the "Argument why the Bihari are not refugees" in the Concept Maps. For Question 16, the Cmap group scored significantly worse than the other groups. The answer to the question was "85%." However, the information provided in the Concept Map incorrectly stated the answer was "65%." Only one participant in the Concept Map group answered "65%," for which credit was given, and none answered 85%.



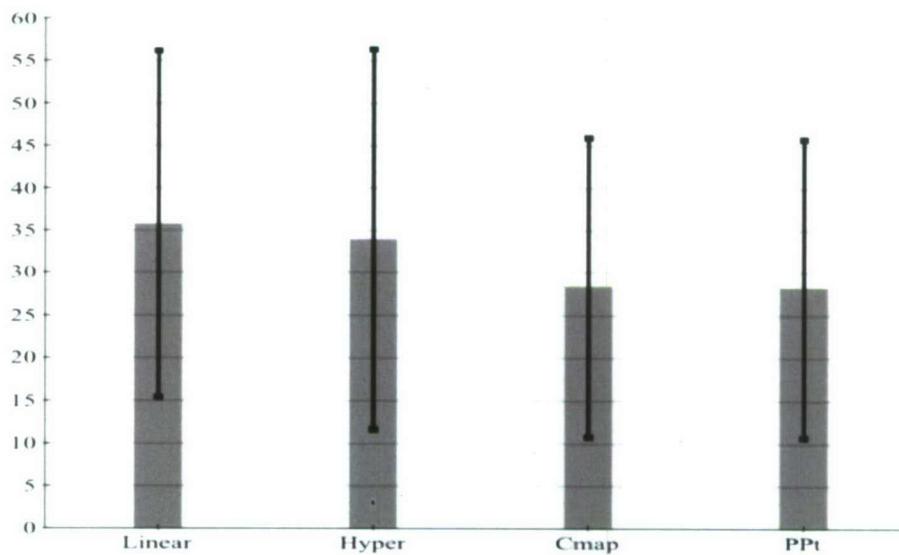
**Figure 12: Performance on each question, by group**

The authors examined the difference between the Pre- and Post-test scores. Three questions were repeated on both tests, and these were discounted from the Post-test scores to determine the difference score.

A one-way ANOVA was conducted to analyze the groups and the difference between Pre- and Post-test scores. Statistical significance was not achieved:  $F(3, 58) = .55$ ,  $MS_e = 388.96$ ,  $p = .65$ . The mean difference between the Pre- and Post-test scores and standard deviations respectively across all participants was 31.82, 19.49.

**Table 7: Mean Difference between Pre- and Post-test scores and SD**

	Linear	Hypertext	Cmap	PPt
Mean	35.78	34.01	28.30	28.26
SD	20.38	22.33	17.68	17.53

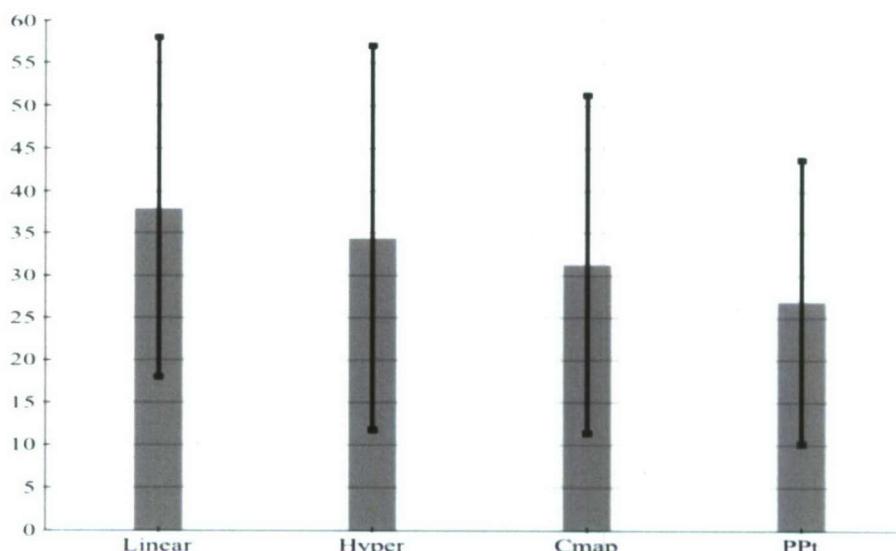


**Figure 13: Difference between Pre- and Post-test scores**

An analysis was also conducted on the difference between Pre- and Post-test scores exclusive of the three outlier questions – i.e., Questions 3, 13 and 16. A one-way ANOVA was conducted to analyze the groups and the Post-test scores. Statistical significance was not achieved:  $F(3, 58) = .79$ ,  $MS_c = 401.35$ ,  $p = .50$ . The mean difference between the Pre- and Post-test scores and standard deviations respectively across all participants *exclusive of the outlier questions* was 32.82, 19.82.

**Table 8: Mean Difference between Pre- and Post-test scores and SD, exclusive of outlier questions**

	Linear	Hypertext	Cmap	PPt
Mean	37.98	34.38	31.32	26.91
SD	19.96	22.62	19.92	16.78



**Figure 14: Mean Difference between Pre- and Post-test scores and SD, exclusive of outlier questions**

## H2

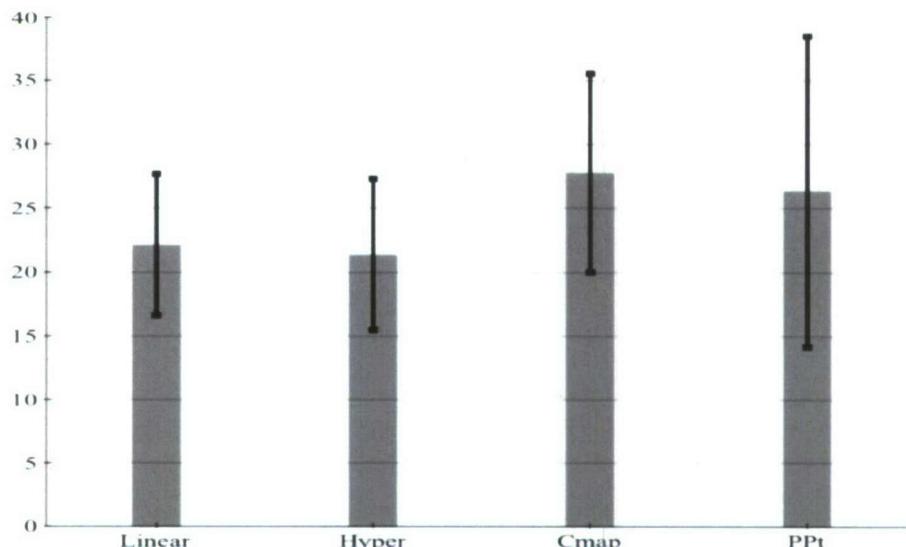
To test H2, the authors compared the measures for acquisition time (in minutes). The time taken to create the Concept Maps and PowerPoint presentation was also compared.

### Duration of the acquisition task

Duration of acquisition was recorded in minutes. A one-way ANOVA was conducted on the duration of acquisition time. Statistical significance was not achieved:  $F(3, 58) = 1.99$ ,  $MS_e = 140.84$ ,  $p = .13$ . The mean time in minutes of duration of acquisition and standard deviations respectively across all participants was 23.64, 15.23.

**Table 9: Mean duration of acquisition times and SD**

	Linear	Hypertext	Cmap	PPt
Mean	22.13	21.38	27.77	26.36
SD	5.51	5.89	7.76	12.16



**Figure 15: Mean duration of acquisition time and SD**

### Materials creation time

In total, the Cmaps were created in approximately 18 hours, or 1080 minutes. In total, the PowerPoint presentation was created in approximately 52 hours, or 3120 minutes.

### **Methods, Assumptions, Procedures and Materials: Survey**

This section details the methods, assumptions and procedures involved in the survey portion of the investigation.

#### **Methods**

##### Design

The survey involved both close- and open-ended questions, and was predicated on respondents' preference for two format types.

##### Respondents

Respondents were drawn from an invited sample of the participants in the experiment ( $N=61$ ), and a sample of professionals drawn from the social network of one of the authors ( $N=75$ ). Potential respondents were invited via email to participate in the survey, and were given the option of providing basic demographic data. Respondents who chose to respond anonymously did provide country information via IP tracking. In total, 34 invited respondents completed the survey, 25 of whom provided demographic data. The respondent sample included professionals, mostly age 26-45, with more than 16 years of education, drawn from government, military and industry occupations, including military officers, research scientists, and marketers. Ninety-one percent of the respondents completed the survey from United States-based IP addresses, while nine percent completed from Israeli IP addresses.

##### Hypotheses

**Hypothesis #3 (H3):** The presentation of information in Concept Map-based format will not be preferred to the presentation of information in PowerPoint-based format.

Respondents reviewed two of the Formats (PowerPoint presentation and Concept Maps) used in the experiment. They were asked to provide their preferences. Thus, for **H3, Preference** was measured, via preference for a format choice. Willingness to present using Concept Maps was also examined as an indirect measure of preference.

#### **Assumptions**

##### Against Concept Maps

Following Wagoner (2004), the authors suspected that most people would prefer a customary format – PowerPoint – to Cmaps.

##### Respondents, snowball sampling and familiarity

One of the goals of the SBIR program is the commercialization of technology for military and non-military customers. Given this, the authors sought to explore the preferences of non-military respondents. In addition to the entire set of experiment participants, the authors also invited

respondents from one of the author's social network to participate in the survey. Snowball sampling was initiated with both groups. The industry group received the following invitation via e-mail on May 8, 2008, and the NPS group received it May 19, 2008 (note: hyperlinks below are not active):

*Sir or Ma'am,*  
*You are invited to participate in a brief Survey comparing idea presentation formats, hosted by Perigean Technologies LLC. You are receiving this invitation from someone who thought you might want to participate. We invite you to forward this message to other professionals in your network you believe might also want to participate. The Survey will run until the end of May 2008.*  
*Click this link to begin the Survey.*  
*Please direct any questions to Brian Moon, Perigean Technologies LLC, [brian@perigeantechnologies.com](mailto:brian@perigeantechnologies.com).*  
*Thank you for time and consideration.*

A reminder e-mail was sent to the industry group on May 23, 2008:

*Thank you to those who have participated in the Survey. It will remain open through May 30. We hope to receive your responses, and encourage you to forward the Survey to others that might be interested.*  
*Click this link to begin the Survey*

To gauge the potential bias of the snowball sample, the authors collected data on the level of familiarity of respondents with PowerPoint and Concept Maps, as a high level of familiarity with Concept Maps could have been an indicator of bias.

### **Procedure**

- Step 1: All respondents initiated survey by clicking on "Click this link to begin the Survey" hyperlink provided in the invitation.
- Step 2: All respondents reviewed online the PowerPoint presentation used in the experiment.
- Step 3: All respondents reviewed online the Concept Maps used in the experiment.
- Step 4: All respondents completed the survey.
- Step 5: Some respondents completed the demographic questions.

### **Materials**

The PowerPoint presentation and Concept Maps were the same versions used in the experiment, and both were viewed in .html.

The instructions were:

**Format Comparison Survey**

*Thank you for participating in our Survey. We are interested in comparing different formats for idea presentation. Results from the Survey may be reported publicly. However, all data will be recorded anonymously, and analyzed and reported in the aggregate.*

*There are four steps to complete. The last step is optional, and we hope that you will complete it. The entire survey should take no longer than 15 minutes to complete.*

***You may want to keep this page open in a separate tab or browser so that you can return to it to continue the instructions.***

***Step 1: Click this link. Enter the Username “raitcmaps” and the Password “Per1gean”. Click “Continue” to navigate and review the presentation. We are interested in your opinions about the format in which the idea is presented, not the idea itself. Please take as much time as you need to study the idea.***

***Step 2: Click this link and review the information. Click the icons  to navigate and review the idea. Again, we are interested in your opinions about the format in which the idea is presented, not the idea itself. Please take as much time as you need to study the idea.***

***Step 3: Click on this link, and complete the Survey. The following instructions are provided for the Survey:***

*Thank you for your voluntary participation in this survey. All data will be recorded anonymously, and will be analyzed in the aggregate.*

*You may stop the survey at any time. However, in order to complete it, you must answer all questions with a red asterisk (\*).*

*Please direct any questions to Brian Moon, Perigean Technologies LLC, [brian@perigeantechnologies.com](mailto:brian@perigeantechnologies.com).*

***Step 4 (Optional): Click on this link, and answer the questions. The following instructions are provided for these questions:***

*Thank you for providing your demographic information. The following page presents five short questions. Your information will help us analyze the results we receive from all of the participants. All data will be recorded anonymously, and will be analyzed in the aggregate. None of the questions are mandatory, and you may stop the survey at any time.*

*Please direct any questions to Brian Moon, Perigean Technologies LLC, [brian@perigeantechnologies.com](mailto:brian@perigeantechnologies.com).*

The survey was managed using PollDaddy.com. The survey questions (and the provided responses for close-ended questions) were:

Q.1 Of the two formats you just reviewed – a PowerPoint presentation and Concept Maps – which do you prefer? (Concept Maps, PowerPoint presentation)  
Q.2 What reason(s) can you offer for your preference?

- Q.3 What reason(s) can you offer for not preferring the other format?
- Q.4 Have you ever created a PowerPoint presentation? (Yes, No)
- Q.5 If yes, what was/were the purpose(s) for creating it/them?
- Q.6 Have you ever created Concept Maps? (Yes, No)
- Q.7 If yes, what was/were the purpose(s) for creating it/them?
- Q.8 Would you consider using Concept Maps to present ideas to audiences? (Yes, No)
- Q.9 If yes, what sorts of ideas might you present with Concept Maps?
- Q.10 If no, what reason(s) can you offer for not presenting ideas with Concept Maps?

The demographic questions were:

- Q.1 What is your age range? (18-25, 26-45, 46-99)
- Q.2 What is your achieved level of education? (12 years, 16 years, 16+ years)
- Q.3 What is your occupation?
- Q.4 What industry do you work in?
- Q.5 Regarding your work tasks, how often are you called upon to present ideas to an audience? (Never, Occasionally, Frequently)

## Results and Discussion: Survey

This section presents and discusses the results for the survey.

### H3

To test H3, the authors compared respondents' preference for Cmaps or PowerPoint presentation reported on the survey. Willingness to consider using Cmaps to present to audiences was also compared.

#### Preference

Of the 34 respondents, 55.88% preferred the Cmap format, while 44.12% preferred the PowerPoint presentation. A complete list of the reasons in support of preferences and against non-preferences are provided in Appendix C. Reasons for Cmap preference clustered around three categories: Form and Content (i.e., the morphology and semantics inherent in Concept Maps), Navigational and Exploratory Freedom (i.e., the nonlinearity of presentation and hyperlinking), and Connectivity with the 'Gist' (i.e., the accessibility of overarching and important information). Reasons for PowerPoint preference clustered around three categories: Familiarity (i.e., the comfort of dealing with PowerPoint), Linearity (i.e., the sequential presentation), and Passive reception (i.e., the perceived low level of effort to comprehend). Reasons against non-preferences clustered into the same categories, reversed for each format.

#### Willingness

Of the 34 respondents, 52.94% had previously created Concept Maps, while 47.06% had not. Regarding willingness, 70.59% said they would consider using Concept Maps to present to audiences, while 29.41% said they would not. Respondents offered a range of ideas they would be willing to present to audiences using Concept Maps.

**Table 10: Types of ideas to present as Concept Maps**

Ideas that are particularly complex, where a map does a better job at illustrating complex inter-relationships than simple text would.	Describing concepts in the physical sciences (e.g., gravity) and biological sciences (e.g., ecosystems).	Anything requiring a rationale, call to action, or decision.
Showing how and why certain products were developed (system design type stuff).	Depict linkages, concepts (thoughts/ideas), data gathering, marketing	Relatively simple ideas with different aspects or decisions/outcomes.
Something more conversational and exploratory.	Complex, highly-interrelated topics delivered to a technical audience.	Topics presented for educational purposes.
Use in training to allow a group to navigate through particular problems.	Link diagrams of counter-insurgency intelligence	Showing connectivity between various knowledge users.
Product marketing presentations.	Any topic with more than a couple information 'branches'.	Corporate culture and influence.
Business Plan	Any integrated system.	Complex plans and proposals.
Actual research results.	Relations, links, flow.	History and Genealogy
Studies	Everything and Anything	Overviews

Respondents who were not willing to use Concept Maps offered a variety of reasons in support of their response. The reasons clustered into three categories: Familiarity, Perceived Limitations in Capabilities, and Perceived Limitations in Use.

**Table 11: Reasons for less willingness to present using Concept Maps**

Familiarity	Perceived Limitations in Capabilities	Perceived Limitations in Use
It doesn't fit into or corporate standards right now - but if it were to, I am sure that I would be able to adapt	My two reasons against are the challenges in navigating while at the podium (may be solved with cunning use of the animation feature, but I'm not familiar with that), and the problem of losing the audience in a too-complex map.	A 'clicking user' of a concept map can discover topics in the order and at a pace that makes sense. A spoken presentation relies on the storytelling skills of the speaker - order, media (e.g., PowerPoint), pace, metaphors, etc. It seems like it would be difficult to develop a concept map that allowed for this kind of delivery without distracting the audience.
Directed to create PowerPoint in dictated format.	I'm not sure how to talk through a concept map with an audience. Concept maps lend themselves to independently explore the component propositions.	Most people think linearly and build concept/information bases in layers, as opposed to building a network of ideas. The networked understanding comes after the foundation of information is already digested. Briefs and instructional material needs to be presented in a linear, piece-wise fashion for most people to follow along.
Not widely accepted	Typically in a presentation format you want more visuals, dialogue, a PowerPoint slide allows for this. Also, easier to internalize the information.	I think they are helpful tools for the person creating them, but it is difficult for most people to grasp. I feel they would be too complex to use in a presentation with the average audience
	A secondary benefit, easy navigation and concept relationships can also be expressed easily through a navigation bar in PowerPoint.	Concept maps are better for solo, interactive use. An audience would have no control over their individual experience, thus the core benefit is lost.
	It might require a laser pointer to isolate a portion of a map. After a while, it is too much work to sort out the maps. Our eyes are not used to scanning concept maps patterns.	I believe that unless you already know about the information to be presented, the concept maps are just confusing.
	Would have to walk them through it, might as well just do PowerPoint.	It's harder for people to follow, unless you were presenting it to them.
	Too small and detailed to present to an audience.	It seems like a concept map is not well suited to story telling.

## Conclusions

The findings provide partial support for H1 and H2, and no support for H3.

### H1

Given the variability of the data, as indicated by the small F-ratios and relatively large Mean-square error terms, primary interpretation of the results for H1 is in terms of the histograms and standard deviations.

On the primary score of interest – Difference between Pre- and Post-test scores – the Cmap group was shown to have slightly outperformed the PowerPoint group, but underperformed relative to the linear text and hypertext groups. The performance against the linear and hypertext groups is not surprising for two reasons: all of the questions were drawn directly from traditional text, and participants were very familiar with the text and hyperlinked text formats.

It is apparent from the Pre-test scores (Figure 10) that the PowerPoint group either had greater content familiarity or were simply better ‘natural’ performers (i.e., higher intelligence, better verbal skills) than participants in all the other groups, despite randomized assignment. This created a bias *in favor of* the PowerPoint group (the Cmap group scored the lowest). While the PowerPoint group recorded the highest Post-test scores and the Concept Map group scored the lowest (Figure 11), both the Concept Map group and the PowerPoint group scored similarly on the Difference between Pre- and Post-test scores (Figure 13). However, when the three outlier questions were discounted, the Concept Map group scored higher than the PowerPoint group on the Difference score (Figure 14). Indeed, the Cmap group fell roughly between the Linear group and the PowerPoint group.

This finding is important in the context of the investigation, particularly when taken in the context of the other results. The PowerPoint group recorded the highest wordcount and proposition counts (Figures 8 and 9). These results can be taken as further indication of either greater content familiarity, or better natural abilities, or the effect of reviewing the PowerPoint presentation and corresponding Notes. Regarding the latter, the PowerPoint group effectively had the opportunity to receive the information set twice by reviewing the slideshow and by reading the Notes. Yet, despite these advantages for the PowerPoint group, the Concept Map group scored higher, on average, than the PowerPoint group on the key measure of knowledge transfer.

The overall performance of the Concept Map group presents an interesting view on the power of Concept Maps for knowledge transfer. In comparison with the hypertext group, the Cmap group underperformed on all measures. This suggests that the benefits of Concept Maps cannot be tied only to hyperlinking or nonlinear presentation. Yet the Concept Map group created the most net-like representations on the recreation task, and was the least ‘verbose’ with regard to the wordcounts and proposition counts. These findings suggest that the Concept Maps served to transfer *memory structures* better than PowerPoint because they were structured as Concept Maps.

### H2

The PowerPoint group scored better than the Cmap group on the measure of average acquisition time. However, the PowerPoint and Concept Map groups’ average acquisition times were larger on average than the other two groups (Figure 15). These findings may be explained for the

PowerPoint group by the abundance of information (i.e., slides and hardcopy notes), and for the Concept Map group by a lack of familiarity with and navigational requirements of hyperlinked Concept Maps. Investigations of the Post-test answers provided anecdotal evidence that the Cmap group navigated to all of the Concept Maps and resources; however, user support for remembering which navigation paths had been followed was limited. Thus, it is likely that the Cmap group required additional time to ensure that all information had been reviewed. Hyperlinking was also employed, though less extensively, in the hypertext group, for which average acquisition time was shortest, suggesting that hyperlinking may introduce some efficiency in knowledge transfer.

The data for materials time creation provide compelling support for H2. Efficiency in idea transfer ought not only be gauged by the duration of acquisition, but also by duration of creation time. In that regard, the skilled Concept Mapper using CmapTools to create the Concept Maps and attach resources dramatically outperformed the skilled PowerPoint slideshow creator by nearly threefold. Potential confounds of the results include the skill of the creators, the introduction of the “Tufte constraints” on the PowerPoint slides, and the incentives for efficiency placed upon both creators. However, even if these confounds are liberally accounted for, the difference materials creation time would still favor Concept Maps with CmapTools.

### H3

The findings do not support H3. The Concept Map-based format *was* preferred over the PowerPoint-based format by the respondents, and a majority expressed a willingness to consider using Concept Maps to present to audiences. Potential confounds of these results include biases associated with the snowball sampling technique. However, the authors believe these biases were sufficiently mitigated by the use of the experiment participants, the inclusion of respondents ‘once removed’ from the author’s social network, and the level of familiarity with Concept Maps across the respondents (i.e., only about half reported having created Cmaps). Moreover, qualitative responses provided meaningful understanding of the reasons for the respondents’ preferences and willingness.

## Recommendations

The results provide sufficient support for continuing this line of research into a development stage. Concept Maps, or more specifically Concept Maps created and shared using IHMC's CmapTools, can serve to enhance performance in organizations that depend heavily on the rapid and accurate communication of complex concepts. Notably, IHMC provides CmapTools freely for federal government and educational users. Increased use of CmapTools for presentation could also result in significant savings for the Department of Defense.

This investigation employed a set of hyperlinked Concept Maps and resources. The Cmaps were presented as "static" representations, requiring the participants and respondents to view them all at once. The complete set of Cmaps and all resources were presented in a web browser to enable all Cmaps and resources to be presented in the same application. Thus, in order to regulate the experience of the Cmap group by only requiring them to navigate in a familiar web browser, the investigation did not fully exploit the current capabilities of CmapTools. If it is true that every picture tells a story, then building a logically coherent picture should support the comprehension of a logically coherent story. The current version of CmapTools (v.4.1.8) allows one to identify portions of a completed Cmap (sub-graphs or even individual propositions) and selectively add them into a view so as to progressively build up toward the complete Cmap, via a Presentation Builder Tool. This sequential addition of propositions or sub-graphs supports the presenter in telling a logically coherent story while maintaining the hyperlinks to all the resources that help illustrate the story. Moreover, because the story is told via navigable Cmaps, the presentation need not remain sequential should the storyteller choose to break sequence.

The Presentation Builder Tool's interface is, according to user feedback received by IHMC's CmapTools Program Director Alberto Cañas (personal communication, February 21, 2008), the least elegant of the modules within CmapTools. Moreover, effective presentation using CmapTools requires workarounds, to include prestaging and negotiating monitor/projector interplay. Presentation also requires mouse-driven feature activation, which anchors presenters to a computer and/or podium. Funding has not yet permitted the development of support for distributed presentation modalities. CmapTools offers basic navigational support in the form of a slide counter to help the presenter remember where the presentation currently is. While CmapTools enables full-screen display of Cmaps, non-Cmap resources typically must be opened in their native applications, which increases the requirement to prestage a presentation. Complete sets of Cmaps and resources can be shared via Cmap servers, however presentation of a set of Cmaps and resources must either be done from CmapTools or exported to .html, which disables features of the Presentation Builder Tool and the Cmap files. These disabled features include the use of Nested Nodes, which enable grouping of concepts and links into parent/child Cmap "pieces." Nested Nodes can be used to create layers in a presentation, allowing the presenter to present information then put it away for later use. This use of Nested Nodes, however, can be hampered by the lack of layer controls in CmapTools. Other options for presenting Cmaps in partial or form/content fashion – e.g., scoping and zooming – are also not yet supported in presentation mode. Finally, CmapTools' Styles options (i.e., graphic design features) have not kept pace with those available in comparable graphics tools.

These features of CmapTools provide numerous opportunities for revolutionizing the way ideas

are conveyed using Concept Maps. Importantly, CmapTools has been constructed around a highly flexible modular architecture. The different domains and environments to which the software is being applied suggest that users will benefit from a choice of configurations, depending on the context of its use. This need for components to be added or removed as desired, together with the requirement that they be developed concurrently, but independently, has justified the modular architecture in which components can be added or removed as needed from a Core module. This architecture has been the key for the current development, and will be key for future enhancements via new components as they are needed, without having to alter the code of the existing modules.

Given the findings of this investigation, the need for further and revolutionary enhancements to the CmapTools presentation features, and the highly flexible modular architecture, the authors recommend the following lines of development. These lines speak directly to reasons Survey respondents gave for less willingness to present using Concept Maps, namely Perceived Limitations in Capabilities and Perceived Limitations in Use.

Next-generation CmapTools Presentation Module. The module's development could include, but would not necessarily be limited to:

- An interface redesign of the presentation mode for CmapTools,
- The development of a compiler for export of complete 'Cmapshows,'
- The creation of navigation and 'roaming' support to enable presenters to always know where they are in a presentation and enable remotely controlled navigation (i.e., collocated but remote, and also distributed presentation),
- Enhancements to the Nested Node feature to include the introductions of layering controls,
- The introduction of scoping features in presentation mode, and
- An upgrading of Styles options.

Codification of Cmap Presentation heuristics. Effective presentation of Concept Maps will require the codification of the rules of thumb currently used by effective presenters, as well as training material on the next-generation capabilities. In particular, distributed presentation will be an important area for user support.

In keeping with the spirit of the SBIR program, each of these two lines of development holds potential for commercialization. The Presentation Module can be commercially sold to any user as a plug-in to the freely available CmapTools, and the training can be provided and/or packaged for sale.

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## Appendix A

### Original Source article

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### The Neglected Stateless Bihari Community in Bangladesh: Victims of Political and Diplomatic Onslaught

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#### Introduction

Bangladesh achieved independence from Pakistan in 1971. After independence, a considerable number of non-Bengali citizens in Bangladesh, known as the Biharis who opposed the independence of Bangladesh, wanted to go to Pakistan but could not do so due to complication in the repatriation process. These people are called "Stranded Pakistanis" or the Bihari Community.<sup>2</sup> According to one report, the community is comprised of over 300,000 yet it is not recognized with a clearly defined identity.<sup>3</sup> They have been living in 66 squalid camps with poor facilities scattered in several areas of Bangladesh for more than three decades.<sup>4</sup> Although they are residing in "refugee camps," the United Nations High Commissioner for Refugees (UNHCR) does not recognize them as refugees. Therefore, they are deprived of the benefits and opportunities extended to the refugees by the UNHCR. As a consequence, the stranded Biharis in Bangladesh face multiple problems.

The objective of this paper is to examine the status of the Bihari people in Bangladesh, highlight the sociopolitical impact of their statelessness, and analyze the diplomatic dilemma they have been facing over repatriation. The central thesis of the paper is that the Bihari community in Bangladesh is an 'artificial minority' because they are considered as a distinct group of people who are not part of the Bangladesh, but yet living there as unwanted refugees. The unresolved status of the Biharis is a result of deliberate procrastination and political indecision on the part of both Bangladesh and Pakistan. The analysis of the Biharis problem is divided into three following sections. The first section discusses the background to the Biharis' problem and their political status in Bangladesh. The second section discusses the sociopolitical conditions of the Bihari community in Bangladesh. And finally, the third section discusses the diplomatic scuffle over the repatriation of the stranded Biharis.

#### Background to the Problem

During the Partition of British-India in 1947, around one million Urdu speaking Muslims from the present day Indian provinces of Bihar, Uttar Pradesh, Madhya Pradesh and Rajasthan moved to East Pakistan, which later became Bangladesh.<sup>5</sup> Their movement to East Pakistan was due to a desire to escape from communal bloodshed and "to preserve their Islamic way of live."<sup>6</sup> They also say *Hijrat* (migration) as an escape from the possibility of living in a Hindu majority India.<sup>7</sup> To their disappointment, when they arrived in East Pakistan, leaving behind their possessions, their familiar environment and professions, they felt alienated in the new society in terms of language, customs, traditions and culture. Although speakers of Pakistan's official language, Urdu, they found themselves as a

<sup>2</sup> The Bihari community is also referred to as *Muhajirs* (defined by the Census of Pakistan, 1951, "a person who has moved into Pakistan as a result of partition or fear of disturbances connected therewith"), Indian-Bangladeshi, non-locals, non Bangladeshi, stranded Pakistanis or Urdu speaking people. The International Convention on Biharis held in Geneva in 1982 referred to them as non-Bangladeshi or stranded Pakistanis. See, Chowdhury (1992:296).

<sup>3</sup> See Country Reports on Human Rights Practices – 2003 (2004).

<sup>4</sup> *Bangladesh Observer*, 11 August 1992.

<sup>5</sup> The partition was followed on the basis of Hindu-Muslim communal violence in Calcutta, East Bengal and Bihar, which is popularly known as the Hindu-Muslim Civil War.

<sup>6</sup> Haider (2003: 525).

<sup>7</sup> In order to escape from the oppression of the non-Muslims, the religion, Islam, encouraged its followers for "Hijrat." For details, see, Ibid., p. 525.

minority Bengali-speaking East Pakistan. These differences resulted in the Biharis identifying with West Pakistan whose dominance over the Pakistani state assured them of receiving greater privileges from the Central Government. While Bengalis were overwhelmingly employed in the agricultural sector, the Biharis, as full citizens of Pakistan, came to be involved in the industrial sector, small business, trade and commerce.<sup>8</sup>

The Bihari community never assimilated with the local people and maintained alliance with the West Pakistani regime against the interest of the Bengali people. They supported the adoption of Urdu as the official language in East Pakistan, where the language of the majority was Bengali, and opposed the Bengalis' language movement in 1952. They also supported the issues of the United Pakistan in the national and provincial elections in 1970.<sup>9</sup> During 1971 Bangladeshi war of independence, the Biharis as Urdu-speaking people of non-Bengali origin, collaborated with the West Pakistani regime and opposed the Bengalis' freedom struggle. When Bangladesh finally achieved independence, Bihari people wanted to go to West Pakistan, but could not do so immediately due to complication in repatriation process. This situation left them stranded in Bangladesh. They were promised of repatriation to Pakistan, but this promise was never fully materialized.

### **Identity of the Biharis in Bangladesh**

The stranded Biharis in Bangladesh suffer from identity crisis. In Bangladesh they are viewed as 'foreign' (Pakistanis) that are stranded. They have been temporarily accommodated in "refugee camps," but they are not regarded as refugees in the conventional sense. According to the Article 6(A) (1) of the Statute of UNHCR and Article 1(1) (2) of the Refugee Convention 1951, a "refugee" is a person who belongs to the following criteria:

- the person is outside the country of his nationality, or in the case of stateless persons, outside the country of habitual residence;
- the person lacks natural protection; and
- the person fears persecution.<sup>10</sup>

All these three criteria are apparently applicable to the Biharis in Bangladesh. However, according to the cessation clauses of the 1951 Convention and the UNHCR Statutes of 1950, a person shall stop being a refugee if among others:

- h/she has voluntarily re-established him/herself in the country which h/she left or outside which h/she remained owing to fear of persecution,

The case of the Bihari Muslims is covered by this clause. Because, firstly, they voluntarily migrated to East Pakistan in 1947 from India; and secondly, in Pakistan they enjoyed protection by the state and were full-fledged citizens after 1951<sup>11</sup> according to Section 3(d) of the Pakistan Citizenship Act, which reads:

At the commencement of this Act every person shall be deemed to be a citizen of Pakistan who before the commencement of this Act migrated to the territories now included in Pakistan from any territory in the Indo-Pakistan sub-continent outside those territories with the intention of residing permanently in those territories.

Therefore, the case of the Biharis was not considered a refugee situation after the partition of 1947, as they were rehabilitated and naturalized in their newly demarcated territories.

The question of the Biharis' becoming "refugees" had arisen once Bangladesh became separate from Pakistan. All of a sudden these people became stateless as they identified themselves as Pakistanis. But on the one hand, they were not refugees as they were not displaced from their place of residence, and on the other hand, they were stranded outside of their country where their status remained unrecognized. These complexities have given rendered the Biharis in Bangladesh a peculiar status, which can be called "artificial minority."

The term "artificial minority" requires an elaboration on the concept of minority first. The term "minority" is

<sup>8</sup> Ibid., p. 528.

<sup>9</sup> Ibid., p. 529.

<sup>10</sup> Khair (1995: 225).

<sup>11</sup> Rahman (2003: 70).

defined in a number of ways. According to the *American Heritage Dictionary of the English Language*, a minority is an ethnic, religious, or other group having a distinctive presence with little power or representation relative to other groups within a society.<sup>12</sup>

In municipal and international legal systems, “minority” denotes a particular meaning. The term “minority” was first legally defined by the Sub Commission on Prevention of Discrimination and Protection of Minorities in Article 27 of International Covenant of Civil & Political Rights (ICCPR) of 1966. The article notes:

Minorities are considered to be a group numerically inferior to the rest of the population of the state, in a non-dominant position, whose members being citizens of a state, possess ethnic beliefs or linguistic characteristics differing from the rest of the population and show if only implicitly, a sense of solidarity directly towards preserving their culture, traditions, religions or language.<sup>13</sup>

According to this definition, the protection of minorities is linked to the criteria of citizenship/nationality, which is usually supported by legal definitions in charters and covenants.

According to the Council of European Commission for Democracy through Law (CDL) a minority is:

A group which is smaller in number than the rest of the population of a State, whose members have ethnic, religious or linguistic features different from those of the rest of the population, and are guided, if only implicitly, by the will to safeguard their culture, traditions, religion or language. Any group coming within the terms of this definition shall be treated as an ethnic, religious or linguistic minority.<sup>14</sup>

In this definition, the requirement of citizenship has been omitted because citizenship should not be a requirement for basic human rights.

Analysis of these definitions shows that the term “minority” is a combination of five elements: (1) number, (2) subordinate status, (3) ethnic or religious or linguistic traits, (4) a well/wish to safeguard or preserve or strengthen the patterns of lifestyle, and (5) in some cases citizenship. The most acceptable of these definitions is that minority people, who are in a subordinate position due to their numbers, have to be different by “ethnic or religious or linguistic traits” from the majority people.<sup>15</sup> In the context of the definition of national minority, the Swedish-speaking Finns are the largest linguistic minority in Finland, the Jews are a religious minority in Germany, and South Asians, Chinese and African blacks are ethnic minorities in the United States. In Austria, the Roma are ethnic minority group, and Asian and West Indians are racial minorities in London.<sup>16</sup> In this way, minority groups in different countries can be identified in multiple ways, but in all cases, these minority groups are a part of the larger national identity.

Bengalis form the majority ethnic group in Bangladesh with 85 percent of the total population. There are also a number of ethnic groups that are considered ethnic minorities. These minority groups are Chakma, Marma, Rakhain, Kol, Vil, and Shaontal. They are ethnically different from the majority Bengalis. They usually live in a particular geographical location (mountainous areas) and maintain their distinct ways of life, culture, religion, language, traditional customs and values. Together they constitute about 15 percent of the total population. Apart from ethnic identity, religious denomination is also applied to identify minority status. Accordingly, there are various religious minorities in Bangladesh such as Hindus (10.5 percent), Christians (0.32 percent) and Buddhists (0.59 percent).<sup>17</sup>

The Bihari community in Bangladesh also has the minority characteristics outlined in the definitions provided earlier. They are ethnically different as they speak in different language. Internally they maintain Bihari cultural values in social life. Due to these characteristics, they maintain a different ethnic identity despite practicing the religion of the Bengali majority. Yet, the Bihari community in Bangladesh is not considered a minority group. The Biharis have been given a peculiar status which is “artificial,” that makes them neither refugees nor minorities. It is artificial because it is a product of an historical legacy of 1947, and of a political context of 1971, which made them live in artificially designated areas (camps) under international agreement. Yet they are literally a “minority” because

<sup>12</sup> The American Heritage Dictionary of the English Language (2000).

<sup>13</sup> Quoted in Guhathakurta (*Adhunika*, nd).

<sup>14</sup> European Commission for Democracy through Law (1991:7).

<sup>15</sup> Schermerhorn (1996).

<sup>16</sup> Farley (1995).

<sup>17</sup> Guhathakurta, (*Adhunika*, nd).

they are insignificant in number. This arrangement separated them from the rest of the society and gave them an artificial identity.

As noted earlier, due to their crisis of identity, the Bihari people are deprived of both citizenship privileges as well as refugee benefits from the international community. The consequence is that they have to shoulder the impact of this unwanted and unresolved identity in their social, political and economic life.

#### **Social, Economic and Political Conditions of the Stranded Biharis**

The ethnic identity *Bihari* has a derogatory meaning in Bangladesh. Since the Biharis are believed to have opposed the independence of Bangladesh, and have collaborated with the Pakistani government in 1971 in the killing of Bengalis, they had to bear enormous social, economic and political consequences immediately after the independence of Bangladesh.

#### **Population**

Overpopulation and population density are two primary problems in the refugee camps. Since 1971 the community people has almost doubled in number due to high birth rate in the camps.<sup>18</sup> According to a survey report in 1992, the demographic figure of this community was 238,093 in 66 different camps throughout Bangladesh (Table 1). The number of residents has further risen over time and that created extreme population density, as the number of camps remained unchanged since their construction in 1972.<sup>19</sup> Presently, it is reported that the demographic figure is approximately 300,000 people.<sup>20</sup> However, no proper survey has been done recently. The following map shows the geographical distribution of the Bihari camps in Bangladesh. The living conditions in these overcrowded camps are very squalid. Families of seven to ten members share a small eight by ten feet living space.<sup>21</sup> Being frustrated with the camp life, sometimes the Bihari People escape from the camp and try to integrate themselves within the local community. Among them, very few are fortunate enough to survive and ultimately become able to give their children education. In most cases, they fail to survive by themselves and eventually return to the camps due to their inability to adjust to the social and economic conditions.

**Table 1**  
**List of Bihari Camps and their Population in Bangladesh**

area	No. of families	No. of Persons	area	No. of families	No. of Persons
Dhaka	12,918	69,767	Thakurgaon	NA	NA
Narayanganj	1,452	7,289	Nilphamari	NA	NA
Syedpur	9,017	69,234	Parbotipur	271	1,632
Rangpur	2,538	15,879	Dhaka (outside camp)	1,207	7,763
Chittagong	2,652	17,302		109	578
Dinajpur	1,542	9,906	Dewanganj	1,185	6,829
Khalishpur	2,382	12,394	Rajshahi	1,029	5,864
Jessore	985	5,539	Khulna	898	5,319
Mymensingh	435	2,583	Bogra	129	788
Faridpur	104	557	Gaibandha		
Rajbari	53	287			
<b>Total</b>	<b>No. of Families: 40,357 No. of Persons: 238,093</b>				

Source: Brief on "Stranded Pakistanis in Bangladesh," Government of Bangladesh, Ministry of Foreign Affairs.

URL: [www.mofa.gov.bd](http://www.mofa.gov.bd) (accessed 23 June 2007).

<sup>18</sup> Dhaka Courier (1979: 1-7 December).

<sup>19</sup> The Daily Janakantha, 21 August 2000.

<sup>20</sup> Country Reports on Human Rights Practices – 2003 (2004).

<sup>21</sup> Tajuddin (1998: 19).

Map: Geographical distribution of the Bihari Camps (*size reduced for report formatting*)



### Health and Sanitation

The living environment of the camps is very deplorable. It is unhealthy, dirty, damp and unhygienic. The camp authorities are neither able nor serious to maintain a healthy sanitation facility. The drainage system is extremely poor, which causes water logging very easily. Therefore, contagious diseases especially diarrhea and dengue are very common. This condition exists in other camps throughout the country. The municipalities/City Corporation cleaners never enter the camps to clear the garbage. It is only when the camp-dwellers drop their garbage in the dustbins outside the camp, that the City Corporation cleaners will take them out. In addition, the entire camp people share a few common bathrooms and toilets, which are very few compared to the number of people (Table 2).<sup>22</sup>

Table 2  
Sanitation in Geneva Camp in June 2003

		Block A	Block B	Block C	Block D	Block E	Total
Source	Toilets	69	68	4	67	65	273
:	Toilets with Shade	8	10	2	8	8	36
Author	Toilets out of order	1 Shade	Nil	Nil	2 Shades	Nil	3 Shades
's	Bathrooms	8	12	2	8	6	36
person	Bathrooms	8	9	2	7	5	31
al	without Roof						

fieldwork in September-November 2002.

According to a recent survey report of *Refugees International*, in Rangpur City (in the northwestern part of Bangladesh), there are only two working wells and ten latrines for the 5,000 residents of Camp Three. The situation is even worse in Mirpur's Millat Camp, where there is only one latrine for 6,000 people.<sup>23</sup> Most of the time they

<sup>22</sup> Based on the fieldwork the author personally conducted in Geneva Camp from September to November in 2002.

<sup>23</sup> Refugees International (2004).

need to queue to get their turn. Furthermore, both male and female alike share the same facility, which creates problems for the females. There is no privacy for the females either in toilet or shower facilities. At night, when young ladies need to visit the toilet, they take their parents or someone else as their guard. Most of the toilets are without shade, and people need to stand in line for their turn. In the shower rooms ladies sometimes have to wait for hours to take bath in groups of three or four.

Moreover, there is an acute scarcity of safe drinking water in every camp. Deep tube well is the main source of water in camps, but there is also acute shortage of tube well in every camp. For example, in Hatikhana camp (Saidpur) there are only 9 tube wells for 400 families. Therefore, people, like in Adamjee camps, need to collect water from the nearby ponds or walk a long distance to take water. So, water born diseases, such as cholera, typhoid and skin disease are endemic. Recently, some NGOs like Revival of Islamic Heritage Society (Kuwait), concern, OBAT Helpers and others are helping them out to lessen this problem by distributing some tube wells, though those are inadequate to meet the demand of all residents.

### **Medical Care**

There are about 25,000 people living in Mohammadpur Geneva Camp, which is considered the biggest camp and is comparatively in good position. There is only one medical clinic (Al-Falah Model Clinic) in the camp which is poorly equipped. A survey report on the Bihari camps in the city of Rangpur (in Northern part of Bangladesh) shows similar inadequate medical facility for them. Moreover, in some cases, camps like Adamji do not have a single medical clinic. As a result, infant mortality due to lack of medical care is quite common. The survey found that 60 percent of infants die before they reach their childhood. Three out of every five newborns die before reaching the age of five. Likewise, inaccessibility to proper medical facilities make women vulnerable to unsafe delivery, chronic diseases like polio, Sexually Transmitted Diseases (STD) and other health problems. A lot of women die every year without getting proper medical care. As these people are very poor, they cannot afford to take medical facilities from other government and private institutions.

However, nowadays, some national and international organizations, such as, Dhaka Shishu (children) Hospital funded by Asia Development Bank (ADB), Worldvision Bangladesh and others periodically support the Bihari camp dwellers by providing free medical check ups for few parts of the Dhaka based camps. So not all the dwellers are benefiting from the few medical aids, as the number of people needing medical care is very large. Furthermore, being poor and uneducated these people are not aware of immunizing their children against most of the lethal and debilitating diseases such as measles, small-pox, DPT, and poliomyelitis. Majority of the people are not aware of family planning. The contraceptive prevalence has been found to be very low in them.

### **Education**

Recently, the Bangladesh government has taken an initiative to improve the rate of child literacy which is called "Reaching Out of School Children" (ROSC), a six-year long project to educate 5 hundred thousand deprived children by 2015.<sup>24</sup> However, this project does not cover the Bihari children in camps. The Bihari camps have almost no educational facilities. And even if there are schools, the poor people cannot afford to send their children to the school. In many cases, if Bihari families want to send their children to school outside the camps, they fail to enroll because of some technical requirements such as nationality, home address or parents' occupation. Though some of them can manage to get enrolled, they find it very difficult to continue hiding these facts. In some cases, when the school authority comes to know that the student came from the camp, that student will be immediately dismissed. In a few cases, those who are studying outside their community school are basically continuing to hide their Bihari identity.<sup>25</sup>

The schooling facility inside the camps is extremely inadequate. There are a total of 55 thousand families in various camps throughout the country. This means that average number of members in a family is five. The current number of schools in the camps across the country is 500. It is reported that only one percent of the Bihari children attends school, which reflects the high rate of illiteracy in the camps. These people are not getting any kind of assistance from the government for their children to get education. It is totally dependent upon the parents' ability. But as the people are very poor in terms of economic condition, they are not able to afford that.

<sup>24</sup> The *Daily Star*, 29 December 2004.

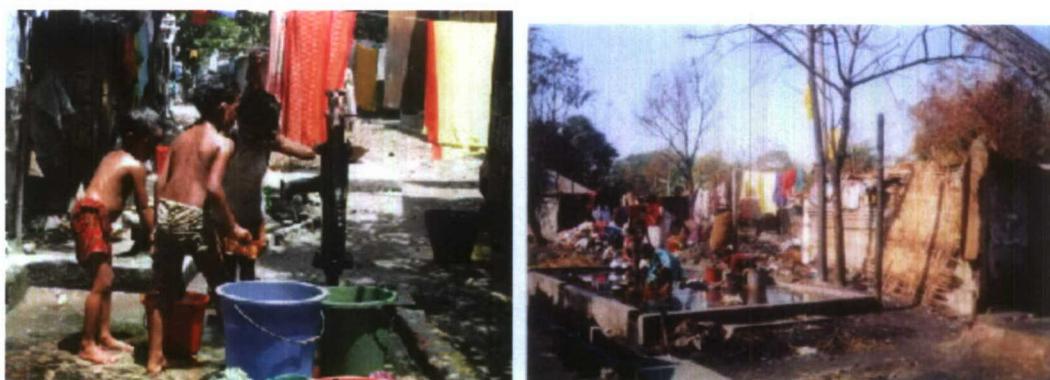
<sup>25</sup> Bose and Manchanda (SAFHR, nd).

In the Mohammadpur Camp, there is only one school named Non Local Junior High School, established in 1974. The school is from Kindergarten to level eight. The school has only ten teachers, one cleaner and one clerk. The headmaster of this school, Showat Ali, admitted that in 1993-94 there were around 450 students in the school but the number decreased to only about 150 in 2003.<sup>26</sup> The headmaster complained that there is a tendency to decrease the number of students in upper classes and the teachers are not paid regularly. Tuition fees for different classes are 40 to 80 taka (Bangladesh currency)<sup>27</sup> per month which is very high for the parents to pay. There is no financial assistance for the students from the government. Recently, some NGOs such as Social and Economic Enhancement Program (SEEP) have provided free education for some students up to class three in primary school. The rest of the school age children do not get this opportunity.

#### Life in Camps



#### Living Areas



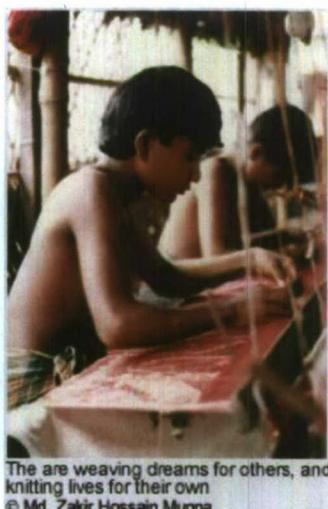
#### The very unhygienic drinking water and bath areas

<sup>26</sup> Based on, the interview with the headmaster in the month of October 26, 2002.

<sup>27</sup> In April 2005, exchange rate, one \$ = 60 taka.



Toilet areas



Source: the pictures are taken from the following websites: <http://www.statelesspeopleinbangladesh.net> ;  
[http://www.meghbarta.org/frames/stop\\_sing.html](http://www.meghbarta.org/frames/stop_sing.html) ;  
<http://www.obathelpers.org/about.html4.html> , (accessed 10 November 2007).

#### Economic Life

The economic condition of the Bihari people is extremely poor because of financial insecurity. During the initial years they were mainly dependent on the relief economy, but over the years the amount of relief has decreased significantly. It is reported that the Bangladesh government used to spend about US\$ 250,000 a month to provide basic needs for them which is very inadequate. However, recently this support is significantly reduced and in some cases stopped. For example, there was a monthly distribution of relief materials provided by the government in

Bihari camps, but this program has been postponed in most of the camps. In the camps, where the program is still going on, such as Adamjee camps in Narayanganj and five out of twenty-two camps in Saidpur do not get the officially approved ration of 3.23 Kg wheat rather 2.5 Kg and the distribution is also very irregular. In addition, nongovernmental organizations also provide food aid. For instance, the Bangladesh Red Crescent gives a small amount of food aid to each family. Yet, it is reported that this food aid is inadequate against the demand.<sup>28</sup>

Secondly, people in the camps are confined to the camp boundary and do not own any land outside the camps.<sup>29</sup> As the economy of the country is basically agro-based, land ownership is very important. But the Bihari people have no ownership of fixed properties such as land and ponds. The economic condition of the camps located outside Dhaka area is particularly adverse because the opportunity of getting employed in agricultural activities is limited. People in those camps are involved in various activities within the camp boundary. Whereas the camp dwellers in Dhaka city can sometimes get work on daily basis such as rickshaw pullers and construction workers though they often face discrimination and harassment. In an interview with *Refugees International*, one young rickshaw puller in Dhaka said that he earns 100 taka a day. After the end of the day, he pays 40 taka to the owner and the rest 60 taka (about \$1.00) is his earning to feed his family.<sup>30</sup>

Most Biharis work as daily wage laborers. The biharis at Millat Camp in Mirpur are working as barbers, sari-makers or doing other petty jobs. Large numbers of them are engaged in producing Benarasi Saree.<sup>31</sup> However, recently their saree industries have been losing markets because of the large inflow of imported goods. Besides, the anti-social elements such as rent-seekers from the Bengali community as well as Bihari community often harass them for economic reasons.

There is little economic opportunity for the Biharis in or outside the camps. Jobs in Bangladesh are scarce, and loans for small business supplies like looms and cloth are virtually nonexistent. Those who manage to start business must combat the rampant crime in the camps, both at the hands of fellow Biharis and local Bengalis, who resent the Biharis for ethnic and political reasons. Arson is a weapon of choice of those targeting the camps, and fires spread like monsoon floods devouring homes and lives.<sup>32</sup>

A good number of old people have turned to begging and an estimated 20,000 unmarried girls are vulnerable to human trafficking and forced prostitution for living.<sup>33</sup> The camp areas serve as safe havens for many criminals, and as a consequence many camp dwellers are directly involved in various criminal activities to earn their livelihood.

### **Internal Political Life**

The political life of the stranded Bihari people is also ripped apart by internal political squabbles and factionalism. The political factionalism of the Biharis is as result of divided loyalties of either supporting or opposing the view of becoming Bangladeshi citizens or going back to Pakistan. The older generation that held the view of returning to Pakistan still dominates the community and tries to persuade the community and tries to persuade the community to support their view. Mr Alhaj M. Nasim Khan is the leader of the Urdu speaking camp-dwellers all across Bangladesh.<sup>34</sup> He is the chief of *Stranded Pakistani General Repatriation Camp* (SPGRC), which had been established on 2<sup>nd</sup> December 1977 with the aim of being repatriated to Pakistan one day. The SPGRC Chief organized many demonstrations, hunger strikes and met the Pakistani high officials including heads of the state several times in order to put pressure on Pakistan. But as he failed in many bids to negotiate with both governments of Pakistan and Bangladesh, and as the whole process of repatriation has got sidelined, his popularity decreased. Moreover, in the present time, there is controversy about the leadership of Nasim Khan. Many of the Biharis believe that when the SPGRC was established, there were no influential leaders to represent this Bihari people. At that time, Nasim Khan claimed to be the leader of this organization and is continuing up to this time, as in their society there is

<sup>28</sup> Khan (2003).

<sup>29</sup> Though these camps are not jail, people can go out and come into whenever they need. But denial from all basic facilities and the identity crisis keep them in an unsecured position. Moreover, a fresh start needs more money which is often a big hindrance for them.

<sup>30</sup> Lynch and Cook (2004).

<sup>31</sup> Falguny (2000).

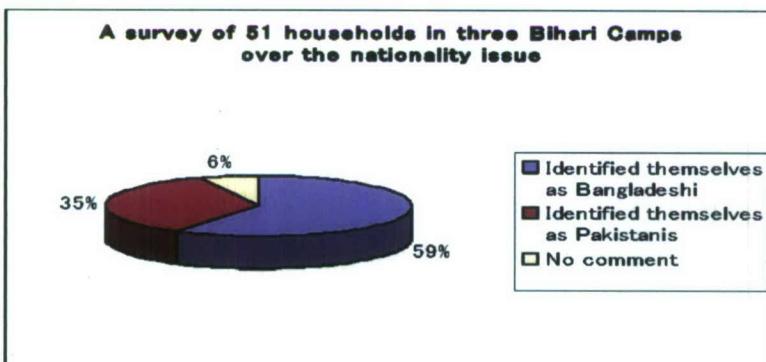
<sup>32</sup> Refugees International (2003).

<sup>33</sup> Ibid.

<sup>34</sup> Ahmar (2002).

no other system to change this.<sup>35</sup> Even some Geneva Camp community people complained that Nasim Khan is no longer physically able to lead this community as he has become very old and sick. His son deputizes for him whenever he is sick.

As a result, it is now evident that some Bihari people have established a new frontier, *The Committee for Rehabilitation of Non-Bangalis* with different objectives. The main supporters of this group are basically young people who considered themselves as Bangladeshis though they are poor and passing a very inhuman life in camps.<sup>36</sup> They do not want to be repatriated to Pakistan. One representative of the Stranded Pakistanis youth Repatriation Movement (SPYRM) states that, "By virtue of birth, we are Bangladeshi citizens and we want to live in this country with equal status enjoyed by the Bengali-speaking Bangladeshis."<sup>37</sup> Another report on the survey of 51 households in Mohammadpur Geneva Camp, Tejgaon Camp and Mirpur Camp, conducted by Refugees and Migratory Movements Research Unit (RMMRU) in 1993, shows that 59 percent of Bihari people have identified themselves as Bangladeshi and wanted to get the citizenship of Bangladesh, whereas 35 percent wanted to go to Pakistan. The rest 6 percent did not comment on this issue.



Source: prepared by author based on *UDBASTU* (Uprooted), Issue 4, April-June, 1998.

Now many of them want a different leadership. They opposed the old leader's dream – to be relocated to Pakistan one day. As the young generation has never set foot on their so-called homeland of Pakistan, to them Bangladesh is their home.<sup>38</sup> They demand Bangladeshi citizenship.<sup>39</sup> An example of this demand is a petition made to the High Court by a group of four women and six men claiming their citizenship rights. The High Court, in August 2003, declared them citizens of Bangladesh by birth and ruled in favor of their voting rights.<sup>40</sup> However, the Bangladesh government is reluctant to abide by the High Court verdict.

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<sup>35</sup> The description is based on the fieldwork the author personally conducted in Geneva Camp in 2002.

<sup>36</sup> The Daily *Manabjomin*, 17 January 2000.

<sup>37</sup> Heffernan (2002).

<sup>38</sup> Khan (2003).

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## Appendix B

### PowerPoint slides, in thumbnail


## Appendix C

### Reasons for and against Cmap and PowerPoint preference

#### Reasons for Cmap preference

Form and Content	Navigational and Exploratory Freedom	Connectivity with the 'Gist'
The CMAP presents a logical connection between the concepts. Thus, the information is more readily prepared for consumption by the brain.	The Concept Map format allowed me to explore the ideas being presented according to the perspectives that I was interested in.	The main ideas are presented in a logical and condensed flow which allows for quick scanning and gives the reader to bypass information that's not interesting, or alternatively, allows the reader to effectively search for particular information.
The added benefit (value) of seeing some implied relationships between the various areas or topics.	Ease of expanding specific concepts for additional information / reference.	The Concept Map format also gave me a better overall perspective on the 'landscape' of the thesis and the argument than the PowerPoint presentation.
Emphasis is on information content (i.e., ideas) rather than presentation format (e.g., graphics).	Easier to go at my own pace and investigate items of particular interest	The presentation allows you to see overall association of ideas and facts. It doesn't force you to go through all the slides until you find the information you are looking for.
The concept maps gave me a better road map for seeing connections.	Reviewing a concept by myself allows me to 'study' and navigate for myself.	Simple link diagrams on one display. Info presented in a higher level hierarchy with the ability to drill down to see details if desired.
The ease of seeing how the details of [information] are related	Having a constant overview option and voluntary control.	Easier to get a global perspective of the topic: 1) can foreshadow how thesis of presentation will be developed, 2) can revisit information.
Less distracting formatting on	The freedom to navigate from	The main topics are bold, you

the CMaps, greater density of information.	any point in the presentation	can learn about them easily and have immediately the whole picture of the text. Just scanning....
Clarity of concepts and their relationships.	I could navigate through the Concept Map presentation.	Text content and context 'popped' out rather than requiring special effort to read.
Clean and concise presentation of information	For skimming, it is easier to navigate and focus.	I could drill down in a specific part of the Concept Map presentation, maintaining an overview.
Quick and concise	I get to select the order of facts to look at.	I did prefer the overview Concept Map over the PowerPoint because I had an instant overview that was easy to grasp.
		Top-down view

#### Reasons against Cmap preference

Familiarity	Linearity	Passive reception
It drives a certain organization of the information that may not be useful to why I'm being exposed to the information or, more importantly, how I will filter and connect different elements of the brief.	Even though I prefer PowerPoint b/c there is a set order of information flow, it was easier for me to understand the amount of information I was dealing with and to gain a better understanding of the issue with the concept maps.	The PowerPoint presentation, although poor and repetitive, could be read solely through the notes. After awhile, I began reading only the notes and ignoring the bullets.
The other format was new and seemed unorganized.	The Concept Maps didn't have a linear flow of ideas and that made it more difficult to connect them in a way that allowed me to build a coherent story of the material.	Not knowing anything about the subject, I'd be less interested in the concept map as I'd have to make a greater effort. It doesn't build.
	It's hard to know where to start reading. Needs some indication of the optimal order of review.	I did not like the more detailed Cmap because it is too much information to look at once.
	Other style made it harder to know if I looked at everything,	

	would forget what I had or had not reviewed.	
	Initial look at the concept map is confusing and nonlinear; hard to figure out where to start.	
	I don't prefer Concept maps because I don't know where to start.	
	The cognitive map was harder to follow.	

#### Reasons for PowerPoint preference

Familiarity	Linearity	Passive reception
I am accustomed to a linear presentation of ideas, though I would prefer an executive summary, and a prioritized grouping of the information.	There is a set order of slides so I don't need to worry if I am missing any vital pieces of information. Left up to me, I would definitely miss something on the concept map.	Along with someone presenting the information, this method flows better, and is easier to look at and absorb information.
It was easier to navigate the PowerPoint presentation since that is what I am used to.	Presents the idea in a clear straightforward manner, easier to digest as opposed to going around in circles trying to follow arrows.	It felt easier to grasp quickly. Had to study the maps far longer to understand.
Familiar outline format; notes provide the detailed information if I want it.	Easier to follow the threads/themes of the report in the PowerPoint presentation.	The Concept map requires more cognitive energy to go through.
It is what I am used to seeing at work.	I think it is easier to tell a story and bring the audience with you in the PPT format.	Easier to internalize.
More familiar with that presentation style.	The PowerPoint presentation draws interest that can build.	
It seemed more concise and familiar.		

#### Reasons against PowerPoint preference

Form and Content	Navigational and Exploratory Freedom	Connectivity with the 'Gist'
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The slides as presented did not give me as clear a picture of the inter-relationships between issues as the Concept Map did.	Not nearly as much accessible information. Even if the information was accessible, a PowerPoint brief would lose effectiveness and become an overwhelming eye chart.	I accumulated details and did not form macro statements. Also summary slides after each chunk of slides (chapter) would have assist to the coherence of the coherence of the presentation.
In almost all of the PowerPoints the choice of backgrounds and text colors made reading the text extremely difficult.	Power Point is very structured and doesn't allow a presenter to 'move around' a presentation if the presenter feels that he needs to.	The PowerPoint presentation gave me no sense of the scope of the paper before I had worked through all of the slides.
Logical associations can be lost through so many pages of information.	Scrolling to read notes at the bottom of the slides was annoying. Didn't take the time to read all the words.	I have missed at the beginning a summary passage and goals of the entire presentation.
Multiple formats were distracting; some were more visually appealing than others.	Not much insight into what was coming next; reader had burden of making connections.	You have to wade through too many slides, and too much information.
Slides in linear order may not be a good way for me to learn	It is linear. I have no idea of how long the brief is while in the middle of it.	Too much to read and try to understand the purpose.
It was harder to see how everything connected.	Too structured.	Finding the key point amongst the chafe [is difficult].